SEPTEMBER, 1954

Traffic Engineering

Plan of Expressways — Kansas City, Missouri — Host City

CONVENTION ISSUE

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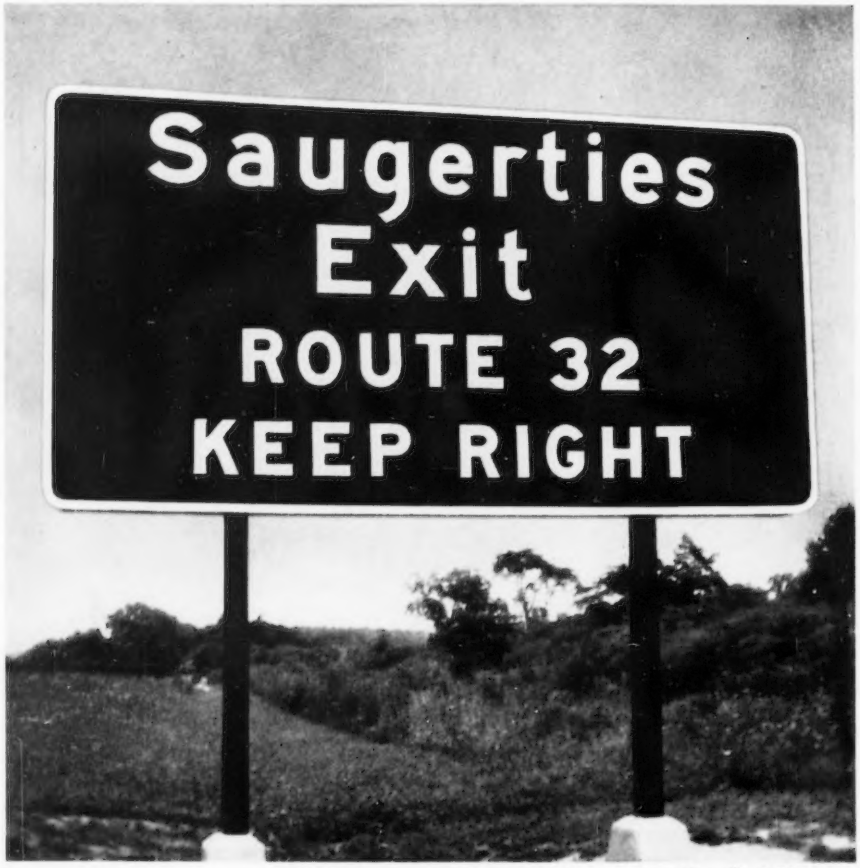

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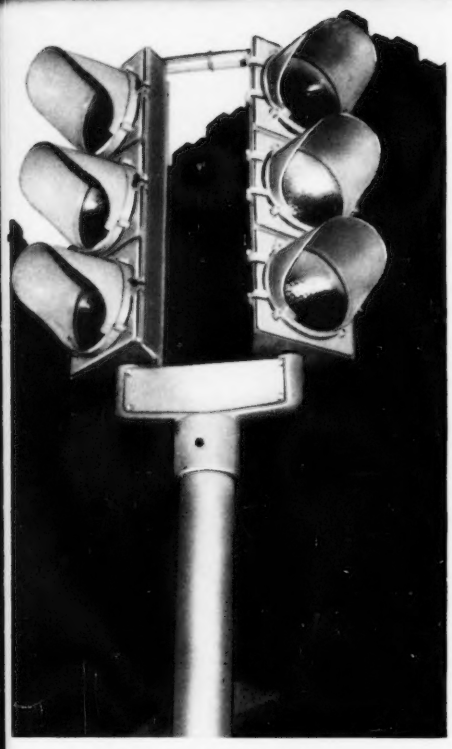


POST TOP MOUNTING with this cast aluminum bracket is one of the many mountings available for G-E adjustable signals.

NEW ALUMINUM REFLECTOR combined with a fixed-focus socket provides outstanding optical performance. Socket permits proper positioning of lamp filament during maintenance or relamping. New color-coded leads and terminal board simplify installation.

New G-E Traffic Signal with Aluminum Reflector Meets I.T.E. Specs. and Reduces Breakage

General Electric's new adjustable traffic signals use an entirely new aluminum reflector which not only meets I.T.E. performance specifications, but by its unique design also reduces dangerous false signal indications by the sun's rays. The reflector will withstand rough handling and virtually eliminate reflector breakage.

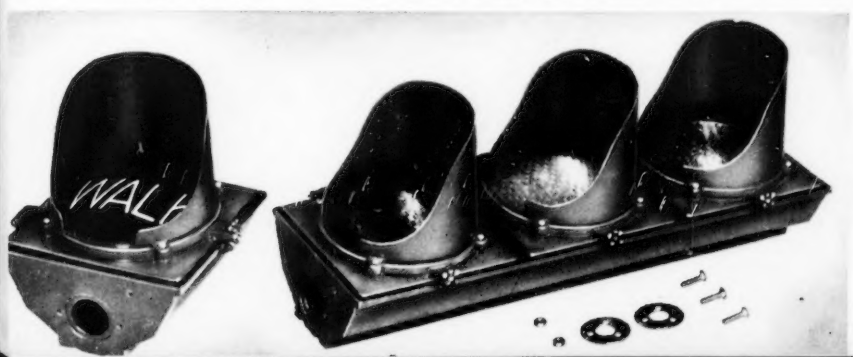
SUPERIOR OPTICAL PERFORMANCE is achieved with this reflector and its unique fixed-focus socket. The socket maintains a fixed distance between the lamp filament and the reflector, yet allows proper orientation of the lamp filament when relamping. Simply screw in the lamp; pull lamp and socket forward slightly and rotate as a unit until the open side of the horseshoe-shaped lamp filament is up; then release. No tools are required.

OTHER FEATURES – Unit construction of strong, non-corrodible, light-weight aluminum alloy makes G-E adjustable traffic signals extremely adaptable to different mounting or color arrangements to meet changing traffic requirements. Installation is simplified by color-coded leads and an accessible terminal board.

COMPLETE INFORMATION on these new signals is found in Bulletin GEC-698, available from your G-E Traffic Control Distributor, or G-E Apparatus Sales Office, or by writing Section 453-62, General Electric Co., Schenectady 5, N.Y.

GENERAL ELECTRIC

UNIT CONSTRUCTION of signals eliminates need for end plates and tie rods; makes it easier to add or subtract sections. Individual signal sections of the same signal can be separately oriented horizontally for maximum visibility in varying traffic conditions.



SPRING CLAMPS at the side of the hinged reflector may be released to swing it forward for easy access to wiring.

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Traffic Engineering

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

VOLUME 24 SEPTEMBER, 1954 NUMBER 12

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In This Issue

Technical Sessions Program and Silver Anniversary Meeting Program . . 442

Traffic Control in a City Manager City . . . 443
L. P. Cookingham

Membership Applications . . . 448

Traffic Operations in Kansas City, Missouri . . . 449
O. J. Falin

City Planning & Traffic in Kansas City . . . 454
Philip E. Geissal

Off-Street Parking for Kansas City . . . 459
Jack A. Hutter

The Northside Redevelopment Parking Project . . . 463
Forrest D. Byars

Transit is Tied Up in Traffic . . . 467
G. H. Frieling

A Parking History of the Country Club Plaza . . . 472
Davis K. Jackson

Kansas City, Missouri Street Lighting Modernization Program . . . 476
Paul C. Box

The Missouri State Highway Expressway Program . . . 480
Rex M. Whitton

Toll Bridges in the Kansas City Area . . . 485
R. N. Bergendoff

Merchants Merry Go Round . . . 495
W. G. Austin

Index to Advertisers . . . Inside Back Cover

COVER: Kansas City (Missouri) Central Business District loop of freeways. This is the system proposed in an extensive study made by the Plan Commission and published as "Expressways — Greater Kansas City." Note the proximity of the Municipal Airport to the downtown area. Not shown in this picture is a bridge recently converted to auto traffic from former rail use, a newly constructed freeway bridge and an additional bridge near the airport still to be built. Kansas City is building a large industrial airport northwest of the city in the direction of freeway proposal shown at the top of the photo.

DEFINITION: Traffic Engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods.

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Frankly Speaking

Ordinarily an editorial by a member of the Board of Direction occupies this page. However, since there are only eleven members on the Board, the Frankly Speaking page of the twelfth issue (September) of our volume year is always prepared by someone else. With many Committee appointments soon to be made by our new incoming President it is most fitting that this month's page be written by the Secretary of the Technical Council, Mr. Evans, who we regret to say has refused reappointment and is retiring at the end of this — his second — year term.

M. M. T.

THE INSTITUTE OF TRAFFIC ENGINEERS TECHNICAL DIVISION is like a great factory in one sense. If you will look into it you will find groups of highly skilled men gathered together at different points working over the development of a considerable number of very important products. These products, the reports, standards and recommendations of ITE technical committees, finally go through the front office, the Board of Direction, and then become the official statements of the Institute. As such, they are the basic building blocks of our growing profession.

What are the qualifications for these factory workers? A Department Head supervises the work of Committee Chairmen under his department. He must be well known in the profession versed in the broad principles covered by his department, able to attend meetings in different parts of the country, and possessed of administrative abilities needed to guide the work of his various committee chairmen.

A committee chairman, on the other hand, must be more of a technician. But besides being more expert in his committee's field, he, too, must have some of the ability to "needle" his committee when necessary in the production of the finished article.

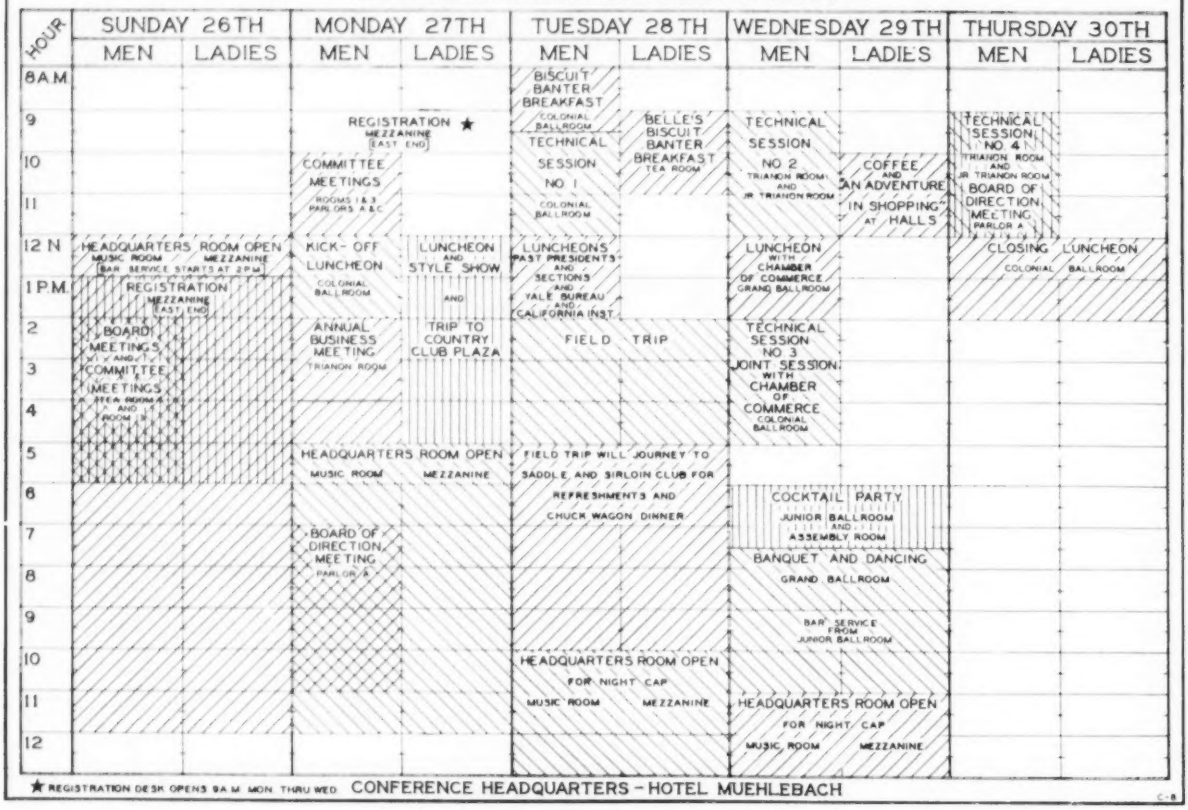
But the committee member . . . there must be the expert technician, the guy who knows all the details and what will work and what won't work. He's the inventor, the creator, the real brains in the outfit. The very fabric of our professional lore is woven in his hands. There may be some buttons and braid sewed onto it later, but the garment is not any better than the cloth in it.

Any and all ITE members who are not now committee members — this is to tell you that we will welcome you into this work as a member of the Technical Division. This is an invitation to take a look at the committees listed in the Institute Yearbook, decide the one to which you can best contribute, and immediately get in touch with the Vice-President, who is Chairman of the Technical Division.

At the September ITE Annual Meeting in Kansas City an announcement will be made of committee personnel for the coming year and a complete roster of all committees will be circulated to the membership at that time. Make sure that you let the Technical Council Chairman know of your desires in connection with committee assignments before that time.

HENRY K. EVANS
Secretary
Technical Council

INSTITUTE OF TRAFFIC ENGINEERS
SILVER ANNIVERSARY MEETING
KANSAS CITY, MISSOURI
SEPTEMBER 26 THRU SEPTEMBER 30, 1954



TECHNICAL SESSIONS PROGRAM

TECHNICAL SESSION No. 1, Tuesday, September 28, 9:30 A.M. — 12:00 Noon. Colonial Ballroom.

Presiding: Nathan Cherniack (Past President I.T.E.), Transportation Economist, The Port of New York Authority, New York City.

1. **The Traffic Problem Created by Automotive Shopping** — Larry Smith, Real Estate Consultant, Larry Smith and Company, Seattle, Washington. Nationally known consultant on location and design of shopping centers and other commercial developments.
2. **Latest Design in Parking Facilities** — George A. Devlin, Vice-President, National Garages, Inc., Detroit, Michigan. One of the country's leading consultants in the design, location and operation of parking facilities.
3. **Design of Freeways and Expressways** — Lamar W. Gardner, Civil Engineer, Street and Parkway Design Division, Los Angeles, Calif. He has had many years of experience in the design of freeways and expressways in the Los Angeles area.
4. **Public Relations and Its Importance to the Traffic Engineer** — Henry A. Barnes, Director of Traffic, Baltimore, Maryland. A nationally prominent traffic engineer who has proven what proper public relations can do.

TECHNICAL SESSION No. 2, Wednesday, September 29th, 9:00 A.M. - 12:00 Noon. Trianon Room.

Presiding and Discussion Leader: F. Bruce Crandall (Past President I.T.E.), Traffic Engineer, Oregon State Highway Department, Salem, Oregon.

Section A — Rural Traffic Problems.

Open forum — general discussion on all rural traffic problems — signs, signals, markings, surveys, speed zoning, administration, planning, etc. Bring your ideas and come prepared to discuss them.

Presiding: Robert A. Mitchell (Past President I.T.E.), Traffic Engineer Wilmington, Delaware.

Section B — Urban Traffic Problems — Operations Section, 9:30 A.M. — 10:30 A.M.

Discussion Leader: Burton W. Marsh (Past President I.T.E.), Director, Traffic Engineering & Safety Dept., American Automobile Association, Washington, D. C.

A round-table discussion on parking, signals, one-way streets, traffic surveys, etc., as related to urban areas. A free-for-all on how to better solve our urban traffic problems.

Section B — Urban Traffic Problems — Planning Section, 10:30 A.M. - 12:00 Noon.

Discussion Leader: D. Grant Mickle (Past President I.T.E.), Director, Traffic Engineering Division, Automotive Safety Foundation, Washington, D. C.

A "bull" session where you can air your pet ideas on expressway design, routing, transit operation, research, traffic administration, etc. An opportunity to share what you know with others and benefit by their views.

JOINT LUNCHEON with Kansas City Chamber of Commerce — 12:00 - 2:00 P.M.

Mr. Charles G. Nichols, President of the G. M. McKelvey Company, Vice-President of the United States Chamber of Commerce, Director of the Dollar Savings Bank and Trust Company, former President and Director of the National Retail Dry Goods Association and President of the Ohio State Retail Council, will be the luncheon speaker at a joint session of the Kansas City Chamber of Commerce and the Institute of Traffic Engineers.

TECHNICAL SESSION No. 3, Wednesday, September 29th, 2:00 P.M. — 5:00 P.M. Joint Session with Kansas City Chamber of Commerce.

Presiding: Leslie J. Sorenson (Past President I.T.E.), Traffic Engineer, Chicago, Illinois.

Panel:

"The Businessman and the Traffic Problem" — James M. Kemper, Chairman of the Board, Commerce Trust Company and Chairman of the Downtown Committee, Kansas City, Missouri.

"The City Attacks Its Traffic Problems" — L. P. Cookingham, City Manager, Kansas City, Missouri.

"Better Traffic for Better Business" — Harold F. Hammond (Past President I.T.E.), Manager, Transportation & Communications Dept., Chamber of Commerce of the United States, Washington, D. C.

"Traffic Engineering for Better Traffic" — Wilbur S. Smith (Past President I.T.E.), Traffic Consultant and Associate Director, Yale Bureau of Highway Traffic, New Haven, Connecticut.

TECHNICAL SESSION No. 4, Thursday, September 30th, 9:00 A.M. — 12:00 Noon.

Technical Session No. 4 will be a round-table discussion on the various phases of the main subject and may include technical papers at the discretion of discussion leaders. Come prepared to participate.

Section "A":

Presiding: Thomas J. Seburn (Past President I.T.E.), Yale Bureau of Traffic, New Haven, Connecticut.

"Traffic Engineering Administration" — 9:00 A.M. - 10:00 A.M.

Discussion Leader: Joseph E. Havenner, Manager, Public Safety Department, Automobile Club of Southern California, Los Angeles, California.

"Professional Standard and Education" — 10:00 A.M. - 11:00 A.M.

Discussion Leader: Norman Kennedy, Associate Research Engineer, Institute of Transportation & Traffic Engineering, University of California, Berkely, California.

"Traffic Control Operations — 11:00 A.M. - 12:00 Noon.

Discussion Leader: Matthew C. Sielski, Director, Safety and Traffic Engineering Dept., Chicago Motor Club, Chicago, Illinois.

Section "B":

Presiding: Lewis W. McIntyre (Past President I.T.E.), Consulting Engineer, 244 Boulevard of Allies, Pittsburgh 22, Pennsylvania.

"Design of Equipment" — 9:00 A.M. - 10:00 A.M.

Discussion Leader: Lloyd M. Braff, Director, Traffic Engineering Division, Los Angeles, California.

"Planning and Geometric Design of Traffic and Pedestrian Ways" — 10:00 A.M. - 11:00 A.M.

Discussion Leader: Alger F. Malo, Director, Dept. of Streets & Traffic, Detroit, Michigan.

"Planning and Geometric Design of Terminal Facilities" — A.M. - 12:00 Noon.

Discussion Leader: Edmund R. Ricker, Traffic Engineer, New Jersey Turnpike Authority, New Brunswick, New Jersey.

Traffic Control in a City Manager City

By L. P. Cookingham

City Manager, Kansas City, Missouri

MUCH OF THE VITALITY of any modern city arises from the general accessibility of its facilities. Indeed the economic welfare and the way of life of a city is dependent upon this factor. When this accessibility is threatened by traffic congestion or poor planning of facilities, the health — the very life of that city is endangered.

This is the challenge which faces every city and particularly the traffic engineer today. To be successful in this struggle against creeping or galloping paralysis, as the case may be, a great variety of technical knowledge must be brought to bear upon the problem. This can only be accomplished with proper organization, imagination, and a willingness to recognize the full scope of the problem. The traffic engineer must make the streets safe for the pedestrians as well as to facilitate movement for the motorists. The skills of the traffic engineer must be applied to save lives and to secure maximum utilization of each dollar available. It is unfortunate that the world "control" has become associated with this effort. For "control" is a misleading word when applied to traffic problems. It implies a negative approach consisting of regulations and regimentation which, in itself, is repugnant to the American people.

Traffic control, if it is to be successful, must be dynamic and positive — geared to the needs and desires of the city's citizens.

This will demand imagination, for in planning new arteries of transportation the form of the city of tomorrow is being fixed. In addition, the traffic engineer must be realistic . He must adjust his dreams to the practicalities of the day. Planning, so essential to sound traffic engineering, must be feasible in both the physical and in the financial sense.

Some idea of the magnitude of this problem may be gained when we realize that a half of all automobile travel takes place on municipal streets, which constitute only one-tenth of the roads in the United States. Is it any wonder that every city is a potential traffic bottleneck.[1] Beyond this it must be realized that the amount of traffic on urban streets is continuously increasing. As an example, since 1946, Kansas City has experienced a general traffic increase of approximately 70 per cent, and some streets now carry as high as 300 per cent more traffic.

As a City Manager, I believe that every city administration has a responsibility to so organize and to so staff itself that it can best cope with this problem. The citizen is entitled to full value for money spent in this field and city administrators must be responsive to the needs of their communities as well as those of individual citizens.

[1] D. Grant Mickle, "The Changing Picture in Highway Traffic," *Civil Engineering Magazine*, September 1952, page 95.

In every city with which I am familiar a double-barrelled approach to the traffic problem is mandatory. First, it is an absolute necessity that immediate steps be taken to make the most of what we have. Every effort must be exerted to fully utilize the existing street system. This entails the use of devices that will bring some degree of immediate relief to the pedestrian and to the motorist. Such things as one-way streets, parking relief, improved street lighting, and citizens' education can go far to improve the flow of traffic and the safety of our streets without exorbitant capital expenditures.

The second approach which should be carried forth concurrently with the first, is development of a comprehensive plan for the foreseeable future. Studies of traffic needs and of future land uses must form the base upon which plans for new trafficways, bridges, and other similar structures are conceived. In this way, and only in this way, can America's municipalities hope to avert complete chaos and economic strangulation in the near future.

The Traffic Department

Earlier mention was made of the necessity of recognizing the scope of this problem and of utilizing proper organization to meet this challenge. Kansas City was one of the first American cities to recognize the need for a unit within the city administration that would be primarily devoted to the problems of traffic engineering. Thus, a Division of Traffic Engineering was created in 1930 as a part of the Department of Public Works. In 1952 this Division was given departmental status which reflected Kansas City's realization that traffic was now one of its major continuing problem areas.

The need for coordination with other departments has not been forgotten, however. The activities of the Traffic Department are synchronized particularly with those of the City Plan Commission and the Department of Public Works, as well as all departments, largely by the use of an administrative committee which functions to coordinate the work of all departments in this field.

The Traffic Department has a total staff of 48 persons, of which 24 are engineering or clerical and 24 are assigned to the installation and maintenance of traffic signs and markings, exclusive of signals.

The budget of the Traffic Department for the present fiscal year is $1,226,741, which means that our citizens pay only $2.62 per capita for all of the services provided by this Department. The major portion of this sum is devoted to operating and maintaining the street signals and street lights under a contract with the Kansas City Power & Light Company at a cost of $1.70 per capita. Personal services amount to only $.33 per capita — the remainder provides for sup-

plies, commodities, and expenditures necessary for the operation of the department.

Duties and Responsibilities of the Traffic Department

As established by the Administrative Code, the broad responsibilities of the Traffic Department include all studies of conditions affecting the safe and convenient use of city streets and boulevards. More specifically, these responsibilities fall into two general classifications, which are: (1) improvements on the existing system to provide for safe and more adequate traffic movement, and (2) the planning of new streets and highways in cooperation with the City Plan Commission and the Department of Public Works.

Planning for New Major Streets and Highways

The long-range approach to traffic control, referred to earlier, is expected to make Kansas City ready to meet the demands of the future. New arteries of transportation are needed to vitalize a street system that is basically more than 100 years old. The potential utility of these new streets rests squarely on the care and the foresight with which they are planned. It is difficult to over-emphasize the need for adequate planning for streets and highways, for the streets of the city provide the basic skeleton upon which the growth and development of a community will occur. If the plans are not sound, the growth cannot be sound.

Planning for new streets and highways is primarily a long range program designed to project traffic needs and to schedule the construction of expressways and major thoroughfares. In Kansas City, the responsibility for the planning of major thoroughfares is vested in an Administrative Committee appointed by and responsible to the City Manager. This committee is made up of the Director of Public Works, Director of Traffic Department and the Chief Planning Engineer of the City Plan Commission staff.

Studies upon which the long range program for street improvement in Kansas City are based were started in 1944 when the Bureau of Public Roads and the Missouri State Highway Department cooperated with Kansas City in the carrying out of an extensive origin-destination survey. This study was supplemented by a cordon count on the periphery of the central business district and an additional origin-destination survey of cross-river traffic in 1946. At this same time a complete survey of both curb and off-street parking facilities was completed.

From these origin-destination surveys and the central business district cordon count, the Traffic Engineering Division developed a traffic pattern showing the existing traffic flow and the major directional desire lines to show the intended straight line direction of the traffic pattern if sufficient routes could be provided. From the traffic volumes accounted for in 1944, a projection for future traffic volumes was carried out for 1948. These projections were then checked by a 1948 traffic count to determine the accuracy of the methods employed.

In addition, the origin-destination data was carefully coordinated with existing and future land use patterns, proposed new public and private developments, and with existing boulevards and major thoroughfares as well as other forms of transportation. From this special data, the City Plan Commission staff began to prepare studies for the location of a system of freeways and expressways which would be designed to carry 1970 traffic volumes as projected.

In 1941, a report, "Expressways, Greater Kansas City," was published by the City Plan Commission. This report recommends a system of freeways and expressways approximately 35 miles in length which is estimated to cost a total of $150,000,000 at today's prices.

As a result of this very detailed and scientific study, Kansas City has one of the most carefully developed plans for limited access highways of any city in the United States. Throughout the planning of this system, the details of location, general design, viaducts, bridges, ramps, access and service roads were carefully studied and analyzed by the Traffic Department in conjunction with the Chief Planning Engineer and the Director of Public Works to be certain that all phases of the program would meet traffic service requirements and fit all other improvements planned, either public or private.

One segment of this planned system, the Southwest Trafficway, was completed in 1950, at the cost of $7,500,000, and in 1952 an agreement was reached with the Missouri Highway Department to construct approximately one-half of the comprehensive system within the next 10 years. An important cross-town expressway and a new freeway bridge over the Missouri River with three-way connections to the northern city limits are under construction. The cost of this phase of the traffic relief program will be in excess of $35,000,000 and will be financed largely by tolls. In addition, a second bridge over the Missouri River from downtown Kansas City to the Municipal Airport with a connection to the new Mid-Continent International Airport located to the northwest of Kansas City, is estimated to cost $13,000,000 and will be placed under construction in the latter part of 1954.

Improvement of the Existing Street System

The traffic problems of today cannot wait for a solution that comes tomorrow. Therefore, coupled with these long-range plans and major construction projects, there must be a short-term program that will bring immediate relief.

In addition, the program of street improvements and developments must be kept within the bounds of financial feasibility. The number of trafficways that a city can successfully pay for during a certain period is limited. For this reason, a realistic traffic control program vigorously examines and applies methods of improving the existing street system. When the traffic engineer positively searches for means of getting better service from existing facilities, he not only increases the convenience and safety afforded citizens, but he also minimizes the burden on their pocketbooks.

The value of a forceful approach to short-term remedies can be vividly illustrated by the experience of Kansas City where there has been a 70 per cent increase in traffic since 1946. The number of fatal accidents has been reduced substantially and the speed of traffic movement is only slightly lower than it was in 1946. In this period only one major traffic artery, the Southwest Trafficway, has been added to the street system. This means that the improvements made in the flow of the greatly increased traffic volume consisted largely of improvements to the existing street system.

Much of the time of the Traffic Department has been utilized in the detailed planning for improvements which are designed to break traffic bottlenecks at critical points. Sometimes these solutions are only minor in scope and involve such relatively simple devices as a medial divider to channelize directional traffic, an island to divide directional traffic, offset signal timing or an increase of curb radii to promote the turning movement in certain directions. Other situations are far more difficult and may involve changing

the entire traffic circulation system within a particular area or the construction of connecting streets or street widenings.

Associated with traffic control is the public relations problem. Where traffic problems or certain difficult situations are known to exist, almost every citizen has his own idea about what should be done to correct these conditions. Therefore, traffic control measures should be carefully considered and evaluated until there is certainty that they will accomplish the intended purpose and will garner citizen cooperation; for major changes carried out and found to be failures will make it more difficult to establish new and additional solutions in the future.

One-way Streets

One of the measures adopted by Kansas City to give immediate relief to its citizens by making fuller use of its existing street system, is the establishment of a pattern of one-way streets. It is said that this device was first employed by the Roman emperors to cope with chariot traffic jams. Despite this fine example, it was not until about 1941, that there was limited use of one-way streets in Kansas City. Initial public reaction was unfavorable to an extension of their use. In 1946, however, after a year of full debate, the system was extended and from that time on, one-way streets have sold themselves on their own merits. Property owners and merchants on the streets, originally opposed to one-way traffic, were polled a few months after the new system was started. The returns from those questionnaires showed that these individuals were in favor of one-way streets by a margin of seven to one.

Following this successful introduction, an additional study was presented to the City Council in 1949 which proposed that an additional 11 miles of streets be designated one-way by pairing two streets to improve traffic routings from one of the heaviest populated concentrations to the immediate vicinity of the central business district. This plan called for an expenditure of over $100,000 to make the two streets one-way arteries. This plan was approved and put into effect in August, 1950, and the results were more than satisfactory. The two streets designated to one-way began to serve over 21,000 vehicles daily at the time the regulation was placed into effect. This constituted an increase, in some blocks, of as much as 300 per cent over the traffic load carried before the one-way system was put into effect. Since this beginning, Kansas City's one-way street system has expanded to include 62 miles of streets.

Street Lighting Modernization Program

The responsibility for street lighting was placed with the Traffic Engineering Division, forerunner of the Traffic Department, in 1944. During the same year, the first definite steps were taken to improve and modernize the street light system.

In 1944 and 1945, when it was impossible to purchase lighting equipment, detailed plans were prepared for the complete renovation of the street lighting system.

The original plan called for the replacement of 13,500 lights within the city, also for an increase in illumination to reduce the hazards of nighttime traffic, and to forestall molestations and other violations of the law commonly found in areas where street lighting is inadequate.

By setting into operation a plan whereby the lights could be replaced year by year on a priority basis, we have been able to modernize our street lighting system at a minimum annual expense to our citizens.

From 1946 until the present time, 18,075 new street lights have been installed. The street lighting program south of the Missouri River is almost complete and it is anticipated that the area lying north of the Missouri River will be completed by approximately January, 1956.

The entire relighting program is being carried out by the Kansas City Power & Light Company, which holds a contract for lighting the city streets, as well as for operating all traffic signals. The Director of Traffic Department administers the contract with the Power & Light Company, places orders for additional traffic signals and street lights, and supervises the timing of the street signal system.

The benefits from the street lighting program cannot be measured in direct terms of dollars and cents, although it can be justified by comparative figures on accidents and violations of the law.

The first year following the lighting improvements, checks on seven miles of street showed that while daytime traffic accidents increased 7 per cent during the year, night accidents were reduced 11 per cent.[2]

After the relighting program had progressed to May 1951, it was found that on some of the relighted streets the ratio of nighttime traffic deaths to those occurring in daylight had been reduced from 9.0 to 1 to 1.3 to 1.

The results of this street lighting program make it obvious that good street lighting is a service that no progressive city can afford to overlook.

Parking Controls

Another measure developed by the Traffic Department to promote traffic movement is the use of rush-hour prohibitions on curb parking. The measure had been used in several isolated spots for several years in the central business district prior to 1946. In late 1946, the principle of rush-hour parking prohibitions was adopted in the central business district. Designed to enable the streets to meet the demands of the rush-hour traffic, this measure prohibited parking between 7:00 A.M. and 9:00 A.M. and from 4:00 P.M. to 6:00 P.M. and also prohibited the standing of vehicles at curbs during these periods. To enforce this regulation, an ordinance was enacted giving the Police Department authority to tow vehicles off the streets if it found a vehicle in a prohibited area during these hours. The owner of the car towed in for this violation then may redeem the car by paying towing and storage charges, plus the fine assessed for the parking violation.

The parking prohibition during rush hours on major outlying streets was established in 1948 after vigorous opposition from owners of abutting properties. The principle of rush-hour parking prohibitions is now well established so that more than 30 miles of routes now have parking prohibitions during the rush-hour periods.

Off-street Parking

Increasing the traffic bearing capacity of streets will not alone prevent traffic congestion. Another necessity is adequate off-street parking. The Traffic Department meets this need by supervising private off-street parking facilities and by helping to plan municipal parking operations.

During the study of off-street parking in 1946, attention was drawn to the physical condition and operating procedures of privately owned parking lots. In many cases these

[2] *Traffic Tune Up*, American Automobile Association: Washington, D. C., 1948, p. 9.

facilities were inefficient and caused unnecessary street congestion. As a result of this study, the City Council passed an ordinance requiring the Commissioner of Licenses to issue permits only upon the written authorization from the Director of the Traffic Department (then Traffic Engineer). This ordinance contains provisions for certain construction requirements as a basis for inspection and approval, including adequate surfacing and lighting, limitations on the location and size of driveways, fencing, walls, and limiting points of ingress and egress. The Traffic Department determines the maximum car capacity for a particular lot and a permit is issued for that capacity, so that the parking lot operation will not require the use of public sidewalks and streets in conducting parking and unparking operations.

Besides these duties, the Director of Traffic also conducts studies for off-street parking stations which are undertaken by the city, such as the New Auditorium Plaza Garage, which is now under construction, and the Northside Parking Project, which will be carried out as a redevelopment project under Titles I of the 1949 Housing Act.

Pedestrian Protection

An important function of the Traffic Department is its safety program. This program involves the problem of safety for persons boarding or alighting from street cars and buses, school crossings, pedestrian safety islands and special pedestrian crossing signals. Since the installation of traffic signals does not always meet the needs of pedestrians and the indiscriminate placement of traffic signals is not desirable, both from the standpoint of cost and from the standpoint of delaying traffic movements, careful planning is as important here as in the other phases of traffic control.

A major part of the safety program is pedestrian protection. The greatest problem in this regard is normally found at intersections in the central business district where the hazards involved in crossing heavy streams of traffic on wide arteries are relatively great.

To meet the problems of turning movements and simultaneous pedestrian crossing in the central business district, Kansas City was one of the first to adopt the principle of separate signal intervals for pedestrian crossings. The need for separate pedestrian intervals in certain locations was recognized in 1948 when 11th Street was made a one-way artery. At its intersection with Main Street, 11th Street has an offset of approximately 110 feet, so that all traffic must make a turning movement at this intersection. Under the old system, the safety of the individual was threatened, because a turn either right or left forced the vehicles to compete with the individuals who were attempting to cross the street. Actual movements of traffic was very limited. A sufficient pedestrian interval providing for a 50-second cycle was provided by adjusting vehicle periods to permit this special cycle. An initial trial run proved this separate pedestrian interval to be a very successful operation from the standpoint of pedestrian safety and also in moving the traffic. Therefore, this type of pedestrian crossing has been added at several other locations in the central business district. It must be kept in mind, however, that because this separate pedestrian interval is desirable in several locations, it does not mean that it is free of limitations. Detailed studies have shown that separate pedestrian intervals are not justified unless pedestrian traffic is extremely heavy and turning movements are in direct competition with pedestrian movement. It is also questionable whether or not separate pedestrian intervals can be successfully employed on wide streets or roadways since the pedestrian interval would have to be extremely long and would tend to restrict major traffic movements to too great a degree.

Pedestrian protection is not a static affair. As the city grows and traffic volumes increase, new problems of pedestrian safety continue to appear. Sometimes these difficulties are solved by special pedestrian islands, push button traffic lights, or a combination of various methods, but whatever the situation, each problem is carefully studied and evaluated to determine the action to be taken.

The Establishment of Traffic Regulations

Traffic control continually involves new and changing problems. In order to keep the problems under control and to meet new situations, it is necessary that there be a degree of flexibility and an opportunity for speed in establishing traffic regulations.

In Kansas City, this has been met by allowing certain traffic regulations to be invoked upon order of the Director of Traffic. Caution is necessary to prevent any arbitrary issuance of regulations. However, when there is a spirit of confidence and cooperation between the City Council and the city administration, a flexible system like Kansas City's is very satisfactory and allows for efficiency in operation. Therefore, within the past few years a procedure has been developed whereby the regulations pertaining to curb parking prohibitions and installation of various types of traffic controls are invoked upon order of the Director of the Traffic Department. For many years, all traffic regulations had to be submitted to the City Council prior to being put into effect.

Under the present system, the Director of the Traffic Department issues a regulation which is filed with the City Clerk, identified by a serial number. In this form, these traffic regulations remain in effect for a period not to exceed 60 days. All new regulations installed by the Traffic Department are presented only once in the official city newspaper and become effective five days thereafter. In the meantime, an ordinance is prepared, and submitted to the Council for approval of these regulations by reference to the serial numbers. In most cases, these regulations are passed by the City Council upon review and recommendation by the Council Committee and become a part of the permanent traffic ordinance covering all traffic regulations. In a small number of cases, objections are raised by the citizens and these specific regulations are then subject to formal hearings by a Council Committee. The Council Committee then takes its recommendation to the City Council for either passage or rejection. This method of processing a large number of traffic regulations that must be adjusted from time to time has been so successful in Kansas City that with the exception of very few cases, all of the recommendations of the Director of Traffic Department have been approved.

Upon issuance of a regulation, the Traffic Department is responsible for the installation and maintenance of all signs and speed markings dealing with traffic control measures. This includes street name signs as well as all traffic and parking control signs. At the present time, Kansas City has over 30,000 street and parking signs and approximately 13,700 street name signs. The Traffic Department processes all new signs and refinishes damaged signs in its own sign shop.

The above mentioned functions of the Traffic Depart-

(Continued on page 489)

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This new gun is diaphragm-operated, eliminating the air cylinder and upper packing gland—the greatest cause of air loss in automatic spray guns.

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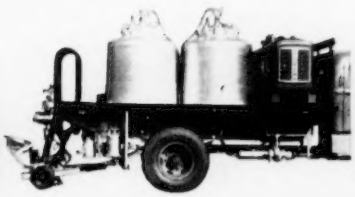
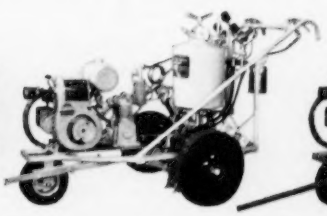
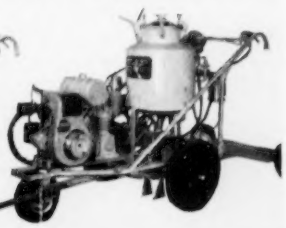


Truck mounted equipment



B-3 for municipal application. Self-propelled.



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Wherever traffic control becomes difficult . . . during rush hours, street repair or emergency, these big, "steel-like" rubber traffic cones demand motorists respect. Available in two sizes, 18 inch and 28 inch, painted or reflectorized.

Manufactured by
RADIATOR SPECIALTY COMPANY
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Membership Applications

The following applications have been received since the list of applicants published last month.

APPLICATIONS FOR TRANSFER

BOOTH, James W., Jr.
Assistant Director
Bureau of Plans & Surveys
Dept. of Traffic Engr.
Baltimore, Md.
August 9, 1954 for ASSOCIATE grade

HALL, Edward M.
Traffic Engineer
Road Dept.
306 Civic Center
San Diego 1, Calif.
August 9, 1954 for ASSOCIATE grade

HEROY, Frank M., Jr.
Assistant Traffic Engineer
City Hall
New Orleans, La.
August 20, 1954 for ASSOCIATE grade

JORDAN, Fenton G., Jr.
Traffic Engineer
City Hall
Norfolk, Va.
July 29, 1954 for full MEMBER

NEW APPLICATIONS

AVERY, Eugene V.
City Traffic Engineer
City Hall
St. Paul, Minn.
July 5, 1954 for JUNIOR grade

BOULDING, Ernest A., Jr.
Senior Traffic Engineer
Bureau of Traffic Safety
State House
Trenton, New Jersey
August 11, 1954 for JUNIOR grade

DESJARDINS, Raymond J.
Planning Engineer
Metropolitan Toronto Planning Bd.
City Hall Annex
465 Bay Street
Toronto, Ont., Canada
July 20, 1954 for ASSOCIATE grade

DONDANVILLE, Laurence A.
Traffic Engineer
DeLeuw, Cather & Co.
150 North Wacker Drive
Chicago 6, Ill.
August 3, 1954 for JUNIOR grade

DUGAN, Dale E.
Civil Engineer II
State Highway Commission of Kansas
Masonic Building
Topeka, Kansas
August 14, 1954 for JUNIOR grade

GONZOLEZ-NOVO, Braulio E.
Chief Engineer of City Planning Div.
Ministerio de Obras Publicas
La Habana, Cuba
July 29, 1954 for ASSOCIATE grade

HAMMOND, William L.
Manager, Transportation & Engineering Dept.
Cleveland Automobile Club
2605 Euclid Avenue
Cleveland 15, Ohio
August 13, 1954 for ASSOCIATE grade

KANZ, Anthony C.
Traffic Control Engineer I
City Hall
Milwaukee, Wisc.
August 16, 1954 for JUNIOR grade

LINSCOTT, Philip M.
Traffic Engineer
DeLeuw, Cather & Co.
150 North Wacker Drive
Chicago 6, Ill.
August 2, 1954 for ASSOCIATE grade

MUELLER, Arthur P.
Asst. District Traffic Engineer
Div. of Highways
819 Depot Ave.
Dixon, Ill.
July 29, 1954 for ASSOCIATE grade

SCHEXNAYDER, Gerard E., Sr.
Assistant Traffic Engineer
Dept. of Public Streets
537 St. Charles Avenue
New Orleans, La.
August 3, 1954 for JUNIOR grade

SMITH, Edwin M.
Traffic Designer
Texas Highway Dept.
Austin, Texas
August 9, 1954 for JUNIOR grade

SMITH, Eugene A.
Traffic Engineer, DeLeuw, Cather & Co.
150 North Wacker Drive, Chicago 6, Ill.
August 20, 1954 for ASSOCIATE grade

TAYLOR, Seymour S.
City Traffic Engineer
Salt Lake City Corp.
City & County Bldg.
Salt Lake City, Utah
July 30, 1954 for full MEMBER

THOMAS, Junius L.
District Traffic Engineer
Dept. of Highways
Culpeper, Va.
July 30, 1954 for ASSOCIATE grade

Traffic Operations in Kansas City, Missouri

By O. J. Falin (Assoc. Mem., ITE)
Traffic Engineer, Kansas City, Missouri

KANSAS CITY, MISSOURI, located on the banks of the Missouri River, just below the mouth of the Kansas River (better known as the Kaw) has an area of 81.7 square miles and a population of 480,000. It is in the center of a rapidly growing metropolitan area about 25 miles in diameter and containing an estimated 875,000 persons.

Kansas City, since its founding, has been a transportation hub — first by steamboats and wagon train — and now by railroad, truck, and air. This city has 19.7 square miles lying north of the Missouri River, usually referred to as Kansas City North. This area was annexed January 1, 1950, and is primarily residential although at present is sparsely settled.

At present, we have only three cross river connections to this area, one of these being the two-lane Hannibal Bridge, another two-lane bridge named Chouteau in honor of one of Kansas City's early families which has been in service about a year, and a third serving cross river traffic is the four-lane A. S. B. Bridge.

By the time this appears in print, we should have our fourth bridge — the $18,000,000 Paseo Bridge now under construction. This is a four-lane toll bridge tied into our freeway system also under construction.

South of the River lies our Central Business District consisting of 36 blocks reaching from 8th to 14th Streets and Wyandotte to Oak Streets. South and east of the Central Business District are the homes of the majority of the people living in Kansas City. There are 62 square miles in that part of our city lying south of the river. Thus, most of our traffic to and from the downtown district, both shoppers and workers, come in on arteries from east and south.

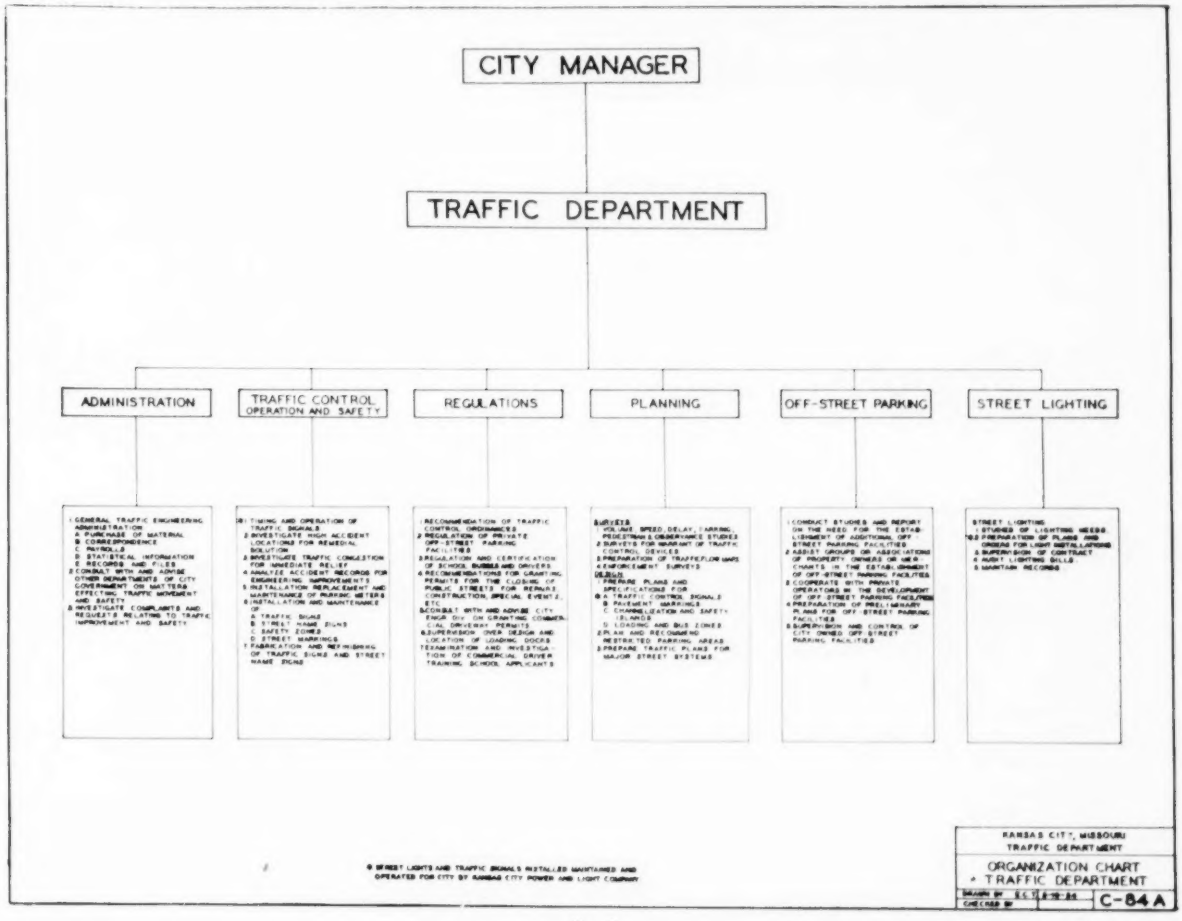


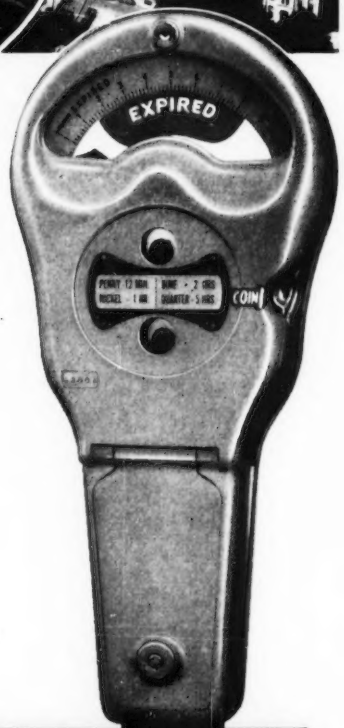
Fig. 1
Organization Chart-Traffic Department.

found the answer with PARK-O-METER

THE PROBLEM. Merchants, property owners, bankers, realtors and other businessmen in Springfield faced declining sales and profits along with rapid deterioration of property and taxable values. They realized that the only way to reverse the trend was to get people to circulate in the Central Business District . . . *people on their feet* not in autos on the streets.

THE SOLUTION. Because the streets are needed for the movement of ever-increasing traffic, curb-side parking was becoming an all too limited privilege. Low-cost, off-street parking was the only answer.

ACTION. Responsible, interested businessmen, intent on preserving their existing business and investment and insuring the future, created space for 225 cars at a metered charge of 5¢ per hour.



YOUR CITY faces the same problem . . . every city does. Ask us to give you details of the Springfield Plan. There's no obligation on your part.

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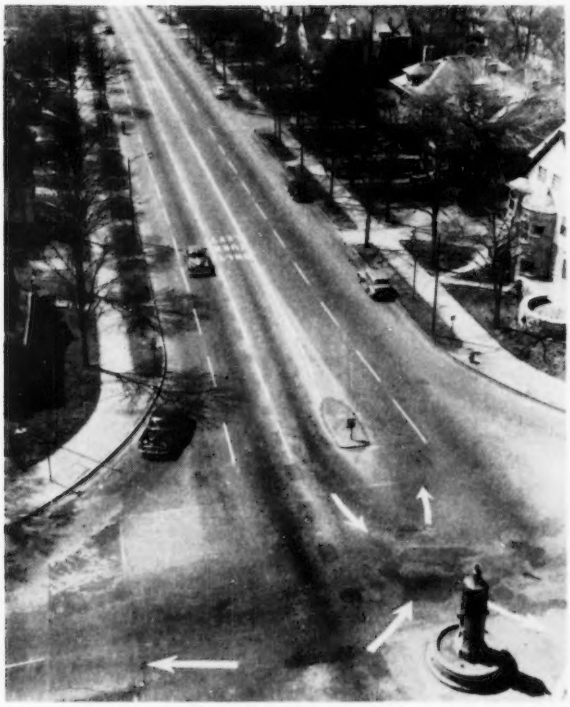

Fig. 2
Channelizing with Paint.

Traffic Department Created

From 1930 to 1952 all traffic engineering operations were under the direction of the City Traffic Engineer and the Traffic Engineering Division was one of seven divisions of the Public Works Department.

In 1952, the City Council raised the Traffic Engineering Division to departmental status. This was in recognition of the importance of Traffic Engineering and to permit this group to turn its full attention to problems created by the unprecedented increase in post-war traffic.

When first established in 1930 the Traffic Engineering Division had only the Traffic Engineer and one clerk. Other employees were borrowed from other divisions. At present, departmental office personnel consists of Director, Traffic Engineer, two Assistant Traffic Engineers and twenty other employees — including clerical help, draftsmen, traffic inspectors and other office personnel, and our 1954-55 budget is $1,226,741 of which $1,004,911 is for Contractual Services, the majority of this figure being for traffic signals and street lights.

Responsibilities of Traffic Department

The Administrative Code of Kansas City states that the Director of the Traffic Department is charged with the following duties:

"Conduct studies of street traffic accident, congestion and other conditions affecting the safe and convenient use of the streets; making recommendations to the City Manager concerning legislation or construction affecting the safe and convenient use of the streets; supervision of placing, maintenance and operation of traffic signs and signals and other control devices.

Install necessary street lighting and keep a record of the number, type and location of all street lights and audit bills in connection with lighting.

Cooperate with other departments in the design of street improvements and make recommendations concerning roadway widths and design.

He shall make a continuous study of public and private off-street parking facilities.

Encourage the development of off-street parking projects by private operators.

Be in control of any off-street parking facilities the city may acquire excepting those at the Municipal Airport and at the Starlight Theatre.

Operate, maintain and collect the revenues from such off-street parking facilities as the Council may deem most expedient to have operated by the city."

The Traffic Department is consulted by the City Engineer's Office in their planning of important street improvements as well as by the City Plan Department in connection with their plan work.

Authority of Director of Traffic

The Traffic Code of Kansas City permits the Director of Traffic to make both emergency and temporary regulations governing traffic. Emergency regulations are effective for duration of emergency. "Temporary regulations" are those installed as part of our routine traffic control program and may consist of parking regulations, stop signs, one-way streets, turn prohibitions, speed control, through streets, or other regulations considered necessary for proper traffic operations. Any regulations installed under this authority, as most of them are, must be approved by the City Council within 60 days.

The procedure is to establish regulation by necessary signs and markings and to publish the regulations in a paper doing city printing. Regulations are effective five days after publication. Copies must be filed with the City Clerk and a copy is sent to the Police Department. Within 30 days an ordinance is prepared listing all regulations by serial number only. Usually these ordinances are passed automatically, thus making regulations part of our permanent Traffic Code.

If there is serious controversy regarding any new regulation, a formal hearing is held before a Council Committee. Then the final action is taken by the Council, either approving or disapproving the regulation in question. In very few cases has the Department failed to obtain the support of the Council on traffic regulations.

One-way Streets

Index counts show traffic volumes have increased more than 65 per cent on our streets since 1946. With only a small staff of traffic inspectors regularly assigned to obtain traffic counts and other data, we draw heavily on previous surveys.

For example, the Origin and Destination Survey made a few years ago in cooperation with the State Highway Department and Bureau of Public Roads, the 1946 Traffic Survey made with the assistance of more than 1,000 Boy Scouts covering the Central Traffic District, and then in 1953 a similar survey covering a larger area was made with the help of the Kansas City High School R.O.T.C. units. The data gathered in the 1946 Survey formed the basis of many important improvements, and the 1953 Survey is now being used in new traffic planning.

Possibly not the most important but certainly the most controversial and most publicized improvement based on data from the 1946 Survey was the one-way street system now in use in downtown Kansas City. When first proposed

it was subjected to severe attacks but finally support was obtained for a trial test period. After it had been in effect for a few months a questionnaire was mailed to property owners and merchants along affected streets. These people who originally could see only ruin in a one-way street system voted about 7 to 1 in favor of retaining this system and favored extending it to additional streets. Needless to say, the motorist endorsed one-way streets almost at once.

Some extensions have been made in the original downtown one-way system. In addition, many miles of narrow residential streets have been designated for one-way traffic. These are usually in areas where multiple dwellings and insufficient garages have created a parking and congestion problem. We have found that one-way operation serves both the motorist and the residents along these streets and usually is well accepted by both.

In 1950 the Traffic Engineering Division submitted a detailed report and recommendation to the City Council calling for an expenditure of about $100,000 for improving two north-south streets and designation of them as one-way streets. The Council acted promptly and this pair of one-way streets is now carrying over 21,000 vehicles per day with traffic increases running up to more than 300 per cent on some sections.

We now have a total of more than 62 miles of streets designated as one-way streets out of a total of 1011 miles of streets open to traffic.

Traffic Signals

World War II stopped installation of many needed traffic signals in Kansas City and with the surge of traffic and easing of restrictions on necessary materials following the war, attention was turned to the installation of needed signals and modernization of some old equipment. From a total of 121 signals in service in January, 1946, signals have been installed as studies indicated the need until at the present time, we have 373 traffic signals in operation.

Kansas City installed its first "Walk" - "Don't Walk" signal at 11th and Main Streets in May, 1948, with all traffic stopping for an exclusive pedestrian phase. Temporary equipment was replaced in the following October by the present type of neon "Walk" - "Don't Walk" lights. As far as the writer knows this was a "First" in this type of control. This type of control has since been extended to other intersections where there is competition between heavy turning movements and important pedestrian crossings.

In addition to regular signal studies, other studies have been made leading to installation where feasible, of leading greens, lagging green, special turn controls, etc.

A good example of special signal control is Linwood Boulevard and The Paseo. Here at the crossing of two major boulevards the Park Department had a pedestal in the center of the intersection that carried considerable sentimental value and consequently could not be moved. It was necessary to devise a control to properly provide for the large volume of traffic that poured through this intersection each day. A special left turn interval was provided and the lane next to the center line was reserved for this movement. Painted markings were installed and we were "In Business" at another intersection.

Traffic signals are installed and maintained by the Kansas City Power & Light Company under contract with the city. Type of equipment, location, and timing, of course, are specified by the Traffic Department.

Parking Regulations

Parking in our downtown district is generally limited to one hour. Where meters have been installed, and we now have a total of 1251 meters in service, the fee is one cent for 12 minutes or five cents for a full hour. In some cases where studies indicate a sufficient demand and where meters are in place, the time limit has been cut to 36 minutes, this time on meter for three cents.

At other points where there is a great demand for short-time parking such as banks and post offices, we have used a 15-minute time limit or if meters are in place, it is limited to 12 minutes.

We have two locations downtown where one side of a full block is limited to 12 minutes. These are blocks containing seven banks and home-loan types of business and 80 per cent of persons park for less than 10 minutes. In each case the installation eased congestion caused by the persons who will take a chance and double park. Further extensions are under consideration.

Our rush hour parking prohibitions are from 7 to 9 A.M. and 4 to 6 P.M. and prohibit standing or parking, thus eliminating loading or waiting for passengers. Many extensions were made following the 1946 Survey and, subsequently, an ordinance was passed that permitted police to tow violators from the street. Each year sees new extensions of rush hour regulations where congestion warrants such controls.

While never too popular with the merchants, rush hour prohibition of parking is becoming more readily accepted as a "necessary evil" resulting from a growth of a street as a major artery, with resulting increase in congestion.

We have about 40 miles of business streets posted with rush-hour prohibitions and more than 13 miles with parking prohibited on at least one side both day and night.

Signs and Markings

All parking and other types of traffic signs are fabricated in our Traffic Sign Shops from blanks purchased ready cut and punched. With more than 30,000 traffic signs plus 14,000 street name signs to maintain, our shops are hard pressed at times. This is especially true in the winter when we do the greatest amount of refinishing and exchanging.

Previous to 1950, our street name signs were purchased from a local sign company. Then we designed a new style and started producing our own signs using a reflectorized background. One of the factors causing us to enter this field was that we could purchase name signs only in lots of 100 or more. Thus, new streets frequently went for long periods before we could install name signs.

At present, we are operating with two radio controlled sign trucks with the city divided between crews. One crew covers the north area down to 27th Street and the other crew from 18th Street to the South City Limits, this giving an overlap of nine blocks. These boundaries of course are elastic.

Both sign trucks and one paint truck as well as one departmental passenger car are equipped with three-way radios. These radios are on a city frequency used by the Water Department and the Public Works Department as well as the Traffic Department. A remote control station is in the Traffic Department office and enables us to send crews at once to any point where an emergency has developed or to supply any information necessary in connection with their work.

Painted center lines and lane lines are maintained on more than 87 miles of streets or about 10 per cent of the total mileage of paved streets. These are maintained by two paint machines built on ¾-ton truck chassis by the Public Works Garage.

Crosswalks are maintained at 625 intersections out of more than 6500 open to traffic.

Maintenance of all painted markings account for more than 10,000 gallons of street marking paint per year.

We keep 24 men busy in our shop and field operations all year round installing and maintaining signs and markings. This includes the Supervisor of Street Markings and two Labor Foremen. Five of these men are on a night crew that does only painting. They cover crosswalks, safety zones, and other markings in downtown and outlying business districts as well as those arteries carrying extremely heavy traffic loads.

Police Cooperation

The Traffic Department enjoys a splendid spirit of cooperation from the Police Department. This is especially true of the Police Traffic and Safety Division.

Copies of all police reports of accident investigations are filed with the Traffic Department and any supplemental information requested is supplied instantly. Also due to this spirit of mutual assistance, any officer feels free to offer suggestions knowing that they are welcome and will be given careful consideration.

Frequently a member of the Traffic Department will attend roll call at Police Traffic Operations Division for two-wheeler, three-wheeler, and corner men. This enables the officers to give their problems an airing and they are able to obtain a better understanding of what our department is attempting to accomplish, and we are able to get a better understanding of some of the problems of enforcement, all of which promote a stronger bond and a better feeling of team work between the Engineering and Enforcement Departments.

Important changes in regulations or additional new regulations are discussed with the commanding officers in the Police Traffic Safety Division in advance of posting, thus preparing them in advance for any necessary changes in disposition of police officers. This is important for other reasons — it does not leave the police puzzled for reason of a regulation; they are prepared to start instant educational actions, and finally they are not embarrassed by suddenly discovering that things "just aren't that way any more."

Permits and Regulations

Many different permits as well as regulations are originated in the Traffic Department. Some of these are permits to close public streets for construction or special events, supervision of design and location of loading docks, permits for loading zones and permits for angle loading on trafficways, boulevards or in the Central Traffic District.

A recent ordinance makes it necessary for the Driver Training Schools to obtain the approval of the Traffic Department before a license can be issued.

As a result of studies and recommendations by the Traffic Division a few years back, the City Council passed an ordinance establishing certain regulations governing all off-street parking lots. The Traffic Department was charged with the responsibility of administering this ordinance which established the maximum permissible width of driveways, type of surface, grades, type of fencing, as well as establishing certain regulations governing the signs and even the lighting for those lots operated at night. A license will not be issued until approved by the Director of Traffic.

Following a serious accident involving a school bus improperly operated, the City Council passed an ordinance establishing regulations and control of all school bus operators and drivers and provided for a regular inspection of all school buses. This also occurred several years ago and again the Traffic Department was given the responsibility of enforcing the provisions of the ordinance. Drivers must pass written tests and demonstrate their ability and knowledge of driving and owners of vehicles must carry liability insurance as well as maintain their vehicles in a condition that is safe as well as comfortable for the children.

School Safety

School safety problems are reviewed by a committee composed of representatives of the Traffic Department, Police Traffic and Safety Division, Kansas City Safety Council, Board of Education and a representative of Parochial Schools when such schools are under study.

Each year hundreds of studies of school safety problems are made necessary due to changes in school districts, traffic patterns, new construction, or from complaints by parents. Questions regarding crosswalks, routing of students, school stop signs, and pedestrian signals are all reviewed by the Committee and such action as indicated is taken.

We have found that working as a committee in this way keeps all interested groups informed and makes available all information necessary in studies of this type. This has paid dividends in cooperation and understanding, as well as support of our policies.

Recently we have developed a set of factual guides or warrants that are used to determine the need for school stop signs, push button signals, and police officer control at school crossings.

Considered on a basis of weights are number of children crossing, vehicular traffic volumes, delay, accident history, sight distance, speed, alternate routes available, and a list of miscellaneous items.

Each item is given a point rating based on range and then the total points for all items are used to make final decision as to type of control, if any, that might be desirable.

These numerical guides have been in use for only a few months and values are not necessarily final but, to date, they have stood up well under severe test.

Conclusion

Thus we review with a sense of satisfaction the past years as this unit grew from a very small beginning as a division of the Department of Public works with only one employee and no budgeted funds, to become a department with 48 employees, constantly increasing responsibilities, and a budget of $1,226,741 for the current year. For this we are appreciative because it is indicative of the increased acceptance of the importance of Traffic Engineering as a necessary part of street and highway planning and in traffic operations upon these streets and highways. Yet, with this sense of satisfaction in our accomplishments we still find room for regret for those cases where we might have done a little better or acted just a little sooner. As we review the past we can use it to some extent as a pattern for the future. We in Kansas City are proud of what has been done in the past but are setting our sights till higher for the years ahead.

City Planning and Traffic in Kansas City

By Philip E. Geissal

Chief Planning Engineer, Kansas City, Missouri

IN KANSAS CITY a railway bridge has just been converted to highway use, there is a new freeway bridge spanning the Missouri, another bridge is planned for the near future, and a third is on long-range development plans. A section of freeway (shown in Fig. 1) is in use, and there are other freeways under construction and additional freeways planned. Adjacent to the municipal auditorium there is a large underground parking garage under construction. At the north edge of the downtown business center, skid row slums are being razed to provide a carefully planned complex of parking garages and lots. To the northwest of the city in Platte County a 4,590-acre industrial airport, tailored to future aricraft and future industrial needs, is taking shape. Outstanding new industrial areas are being developed or planned. New areas in and adjacent to the city are being subdivided and the home building boom continues.

It is estimated that population within the city limits of Kansas City, Missouri, has increased from 456,000 to 475,000 between 1950 and 1954 while the metropolitan area has increased from 814,000 to 875,000 in the same period.

These things, which demonstrate that Kansas City is a vigorous growing city, all have a direct effect on traffic. They also indicate the great importance of coordination between land use planning and traffic engineering. We are proud that Kansas City has one of the outstanding traffic departments in the nation and feel that there is excellent cooperation between the traffic and city planning departments. This spirit of cooperation and coordination has been furthered by the policy of the City Manager in setting up administrative committees composed of staff members of various city departments to study specific problems.

As city planners, we believe that the traffic engineers, public works engineers, school administrators, industrialists, realtors and builders, and many others, must participate in the planning process to create a city which will better serve, or continue to serve well, the needs of people. The job of the City Plan Commission is to coordinate the various ideas and uses into a harmonious unit. The planning and design of streets and the elements of traffic operation to provide for the efficient circulation of people and goods is an important part of the over-all plan. However, it is only one part, and there are times when certain valid traffic operational procedures should give way to some of the other needs in the life of the city. We feel that good long-range planning will help to eliminate many of the present and future traffic engineering headaches which otherwise would occur.

Why do we say this? How does a planning agency relate traffic to land and its uses? How is traffic and traffic engi-

Fig. 1

The Southwest Freeway in Kansas City showing a grade separation with modified access. Note commercial traffic and public transportation vehicles, one of which is stopping at a turnout to discharge passengers.

neering involved in the planning process? Before getting at the answers, let's take a look at some of the long-range planning here in Kansas City during the last ten years.

Kansas City has had a planning agency since early in 1920; however, it was not until 1943 that the size of the staff and the scope of the program were sufficiently large to undertake a truly comprehensive planning program. At that time, a detailed study was made of the conditions of housing and the characteristics and distribution of population as a basis for planning for residential areas and the definition of residential neighborhoods. A preliminary report recommending a plan of major thoroughfares, truck and transit routes, which considered these factors in relation to residential, commercial and industrial areas, was prepared. A study for the development of the 3,000-acre riverfront area as an industrial district with recommendations for major trafficways, railroads, water-rail-truck terminals and river crossings in that district followed. These studies, as well as others pertaining to business and industrial land use, schools and recreational areas, and the location of public buildings and public service facilities, formed the basis of the Master Plan, which was completed in 1947 and used as the basis for a Bond Program of Public Improvements. This plan provided for logical and orderly arrangement of the various types of land uses within the city, served by an efficient network of freeways, major and secondary thoroughfares which would take care of the necessary traffic movements. Where possible, heavy traffic was kept out of the interior of residential neighborhoods.

In 1951, a detailed report called "Expressways — Greater Kansas City" was published. This report analyzed the existing and future traffic demands, substantiated the need for a system of freeways and recommended desirable locations. It also analyzed the existing street pattern and recommended additional by-pass and circumferential routes. Basic in this study was the provision of traffic service where needed in such a manner as to preserve residential and neighborhood living qualities. The location of freeways was so fixed as to minimize the bisecting of residential neighborhoods and to improve travel time to major places of employment — both the central business district and other centers of employment.

The proposed freeway system consists of a loop around the central business district as illustrated on the front cover and radials connecting with inter-regional highways or traffic generating areas. An interesting sidelight is that consideration was given to the question of whether the loop around the central business district would cut off adjoining commercial, warehouse and wholesale areas from the central business district to their detriment. After study of the situation, it was felt that while the freeway formed a boundary, it actually did not separate the areas. Most of the existing streets will be carried across the freeway on grade separations, and access would actually be easier than across the present heavily traveled streets. This plan was approved by the Bureau of Public Roads and the State Highway Department of Missouri. The report was prepared by a special staff of the City Plan Commission, which undertook the essential research under general supervision of the State Highway Department. Policy formation was by an inter-regional highway committee. In many ways this study was a splendid example of essential cooperation between the planners and the traffic engineers, especially on the traffic analysis and projection phases of the report. The highway engineers furnished origin-destination data; the traffic engineers assisted in travel time analysis and supplementary traffic counts; and the planners related all data to master plans of land use, population growth and travel habits to predict future needs.

The significances of this organizational arrangement for a planning project was pointed out in a German publication, in an article on the Kansas City Expressway report, which noted that "here a successful attempt was being made to coordinate the frequently so contradictory viewpoints of the highway engineers and of the city planners. The fact that a planning agency was in charge of the project made it possible to integrate from the very beginning the planning of new urban highways into the general master plan thinking in this metropolitan area with respect to the various phases of industrial planning, neighborhood and community planning, urban redevelopment, etc."[1]

In late 1950, the Commission started studies for redevelopment of blighted areas near the central business district under provisions of Title I of the Federal Housing Act of 1949. One of the projects studied — and the first one to be undertaken — involved the removal of a skid row area adjacent to the freeway at the north edge of the central business district and development of an integrated system of parking garages along a widened Main Street forming a greatly improved entrance to the central business district (Fig. 2). This is the realization of a recommendation of the Master Plan which pointed out the importance of parking terminals along the expressway loop. Traffic Department studies of parking needs were utilized in planning this project and careful analysis of street capacity, entrances to parking areas, and traffic movements were made by the Traffic Department. This is another good example of coordination of the planning and traffic engineering functions. Although the responsibility for carrying out the redevelopment project rests with the local redevelopment authority, which was formed in 1953 to take over the city's responsibilities, the planning phases of the work are carried on by the City Plan Commission under special contract.

The best opportunity to carry out a completely integrated development coordinating land use and trafficways came with the annexation of about 19 square miles north of the Missouri River in 1950. Master Plan studies were started immediately and an effective system of traffic arteries serving as neighborhood boundaries was planned. In this area all of the problems of coordinating traffic arteries with business and residential uses have been faced. Because the area was largely undeveloped — but subdivision activity was great — it was possible through subdivision control to provide a street pattern which discourages through traffic on neighborhood streets and concentrates it on arteries at the edges of neighborhoods. It was also possible to obtain rights-of-way for many of the major arteries at the time of the platting of the subdivisions. Sites for shopping centers had to be designated in proper relation to each other, to residential areas, and to the pattern of thoroughfares.

A system of playgrounds, parks, parkways and boulevards has been devised wherein some of the major thoroughfares will be developed as parkways but will carry mixed traffic. In the part of Kansas City south of the Missouri River there is an extensive boulevard and parkway system which in some

[1] Roeseler, Dr. Wolfgang, Traffic Research and Urban Highway Planning in an American Metropolitan Area, *Bruecke und Strasse*, July, 1952.

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Fig. 2

Northside Project (Parking).

instances parallels major thoroughfares and in other instances follows the only logical traffic routes. While it was designed for exclusive use by passenger vehicles, in some instances it has been necessary to allow mixed traffic — over the considerable opposition of residents on the streets. It is felt that the system in Kansas City North can eliminate this problem by proper design of these dual use thoroughfares and the elimination of residences fronting on them. The accompanying map (Fig. 3) shows the system of traffic arteries planned for Kansas City North.

One of the basic premises in all City Plan Commission studies is that the plans must be segments of good metropolitan-wide development. Not only is the Plan Commission of Kansas City, Missouri, aware of metropolitan-wide trends; it maintains active working relationships with all planning agencies in the Greater Kansas City area.

This review indicates a broad planning program, much of it affecting or being affected by traffic. The scope of the studies should suggest that the Plan Commission is interested not alone in how traffic moves, but why it originates, where it originates, and what its effects are on other land uses, for traffic is essentially a form of land use. The Commission endeavors to apply forethought to these problems to the end that a conscious direction of the variables will produce solutions which provide the basis for safe, convenient and economical circulation, but not at the expense of amenities, property values and people.

For example, it can be pointed out that one-way streets are effective devices for preventing traffic strangulation through adaptation of existing facilities. Regardless of their potentiality for moving traffic, however, one-way streets are not necessarily desirable if, in the process, the economic life of the community is unduly disturbed or good residential environment is destroyed by transforming quiet residential streets into major traffic arteries. As an agency charged with the responsibility of consciously determining the general land use pattern, the Plan Commission feels that it must insist that more than traffic engineering considerations be incorporated into such decisions. It also feels that a high degree of coordination can and should be effected in all its long-range planning with the end purpose of making necessary fewer expediencies or compensating solutions in the future.

Neighborhood planning is another example of the conscious direction applied to the variables with which it works. With the knowledge of why and where certain types of traffic originate and the effects of this traffic upon various land uses, it proceeds to construct a physical pattern which will meet the composite of determined needs of the neighborhood. Good design achieves good traffic circulation and good residential environment, neither at the expense of the other.

In our day-to-day short-range planning we have many contacts with traffic and make many recommendations which affect it. In our subdivision regulations, for instance, we prescribe standards that affect the layout and width of streets, the design and frequency of intersections, the size and location of parking lots, and the relationship of traffic generating uses to the circulation system.

The problem of secondary shopping centers, which face much the same situation as the central business district with

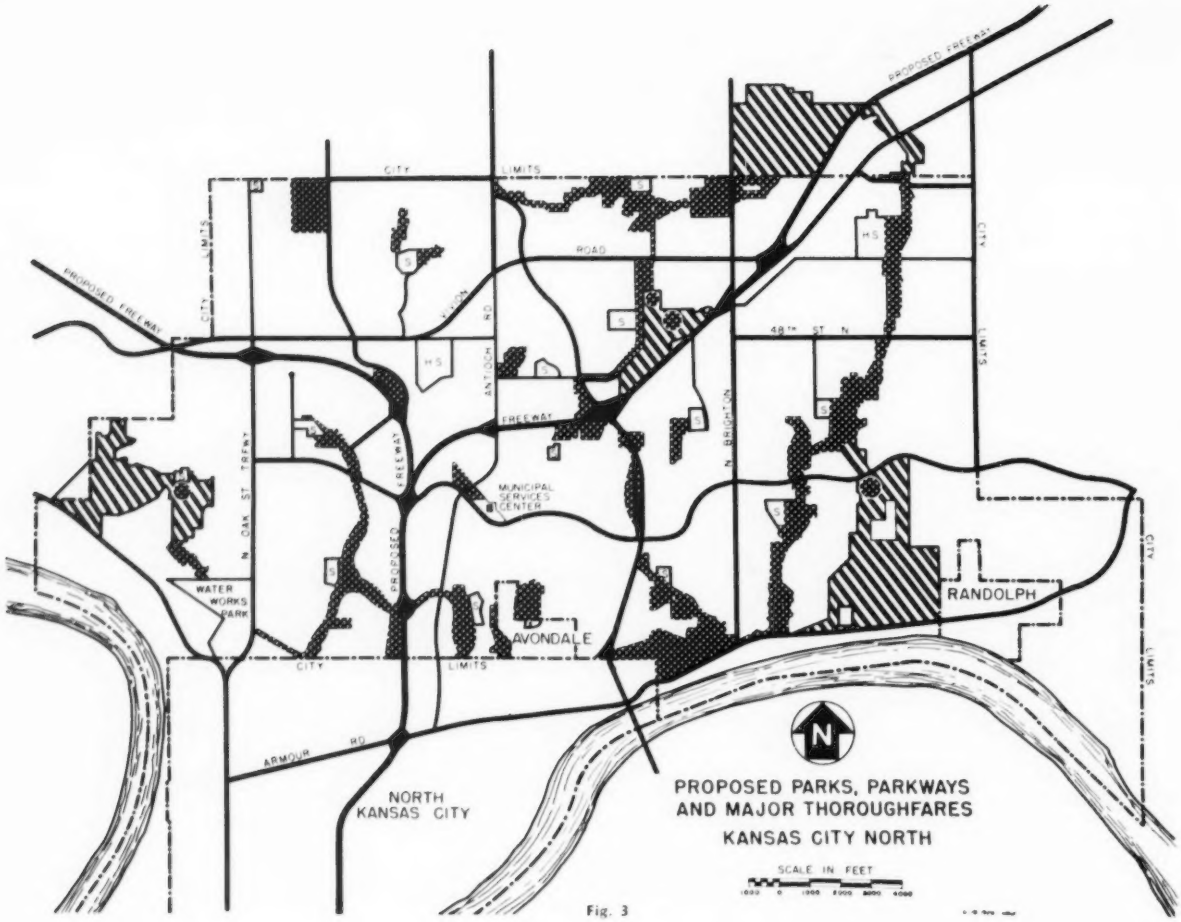


Fig. 3

congested streets and loss of business because of parking difficulties, has been the cause of concern for some time. The Commission pointed out the necessity of providing off-street parking in these centers and, working with business district associations, prepared preliminary plans suggesting specific solutions at several of the centers. Because of the necessity for city aid in acquiring parking sites, the city council passed an ordinance providing for acquisition of properties for parking on a benefit assessment basis. Procedure for processing proposals submitted by the business districts was established, which called for joint review and recommendations by the Traffic Director, Finance Director and City Plan Commission.

Under our zoning authority we also have a considerable responsibility for traffic. Zoning, as a tool for attaining a more desirable land use pattern, is in fact directed in many ways toward the bettering of traffic conditions. Through the land use and density requirements it can be a powerful tool in controlling the number and type of traffic origins. The building set-back restrictions have considerable meaning in terms of visibility at intersections. The off-street parking and off-street loading requirements are a strong factor in providing for traffic flow. The Plan Commission attempts to keep the ordinance in step with the times. Kansas City is one of the few cities which has in its zoning ordinance separate and specific provisions for planned shopping centers, which include requirements for adequate off-street parking and control the location of buildings and driveways. Relation to traffic is, of course, an important consideration.

There are other day-to-day and long-range relationships between planning and traffic. The broad interest in traffic on the part of the Plan Commission is evident in the scope of the planning activities that the Plan Commission has undertaken in the last ten years.

It was pointed out that the Plan Commission is interested not alone in traffic movement as such, but in the origin and type of traffic and the effect it has on adjoining land uses. With information pertaining to these things, physical patterns of land use can be encouraged which overcome traffic problems without the expensive and serious consequences of expedient solutions which the traffic engineer may otherwise consider necessary. These expedient solutions which are necessary can often be made to have less serious consequences if the Plan Commission's viewpoint is considered.

The City Plan Commission has many areas of responsibility wherein it can assist in achieving a better circulation system and a better traffic situation. It can do this in long-range planning. It can also influence traffic to a considerable extent through the application of zoning and subdivision regulations. It is accustomed to thinking in terms of a metropolitan area concept. Certainly an awareness of the responsibilities and the capabilities of the Plan Commission is an initial step on the part of a city government that wishes to achieve a rational, unified solution to traffic problems and enhance those portions of the city's structure which are vital to its economic and social welfare.

Off-Street Parking For Kansas City

By Jack A. Hutter (Assoc. Mem., ITE)
Director of Traffic Department, Kansas City, Missouri

Fig. 1
Artist's drawing of garage superimposed on photo of downtown section.

KANSAS CITY, MISSOURI, is the "Central City" of a metropolitan area which encompasses a population of 875,000 persons. It had long been recognized that an adequate transportation system must be provided to accommodate the traffic demands imposed upon the city. The planning for such a system was culminated in 1951 when an engineering report entitled "Expressways, Greater Kansas City" was completed.[1] The report presented in detail the analysis and design of an expressway system combined with an improved city street network which would serve the traffic demands of the metropolitan area.

It was soon recognized that the rapid population growth of the Kansas City Metropolitan Area combined with improved traffic access to the "Central City" through an expanding expressway and street system would create a problem, if left unsolved, more serious than that of retaining an antiquated roadway network. To provide for the expeditious movement of vehicles would be of little value if adequate parking facilities were not provided at the end of the trip. This was the problem confronting Kansas City and the impact of the parking demand was most noticeable in its Central Business District. The increasing usage of the automobile for business, shopping, and recreational needs was taxing the parking facilities of the area beyond their maximum capacities.

Through the years private enterprise did a splendid job of providing suitable off-street spaces in the Central Business District in an amount sufficient to meet the parking demand. The point was soon reached where it was no longer practical for private operators to expand their facilities, due to high real estate costs and the inability to find vacant land suitable for the economic operation of a lot or garage facility. To cope with this problem, the City Council established in March, 1952, a new department of the city government known as the Traffic Department, to replace the then exist-

[1] "Expressways, Greater Kansas City", prepared by City Plan Commission, Kansas City, Missouri, March 1951.

ing Traffic Engineering Division. The new department was given, in addition to the existing traffic engineering functions, the complete control over the provision and regulation of off-street parking in Kansas City. The duties assigned to the Traffic Department relating to off-street parking include the following:

(a) To make a continuous study of public and private off-street parking facilities and to report to the City Manager as to the necessity for the establishment of additional off-street parking facilities.

(b) To encourage the development of off-street parking projects by private operators and to cooperate with private operators by furnishing them the results of traffic studies and other available information relating to design and operation of off-street parking facilities.

(c) To have control of such off-street parking facilities as the city may acquire and to execute leases to private operators of such facilities as the Council deems should best be operated by private operators and to enforce such leases and collect the rentals therefrom.

(d) To prepare preliminary plans for off-street parking facilities showing type of facility and parking arrangements and to approve final construction plans.

(e) To operate, maintain and collect the revenues from such off-street parking facilities as the Council may deem most expedient to have operated by the city.

The first major project undertaken by the Traffic Department was that of investigating ways and means of bringing into reality a much talked about garage facility for the Central Business District. Proposals had been made many times during the past ten years for the construction of an underground garage beneath the Municipal Auditorium Plaza, a site located in the block directly north of the Municipal Auditorium and bounded by 12th Street, 13th Street, Central and Wyandotte Streets. The need for such a facility was based on the fact that the site in question would serve the parking demands generated by the Municipal Auditorium. In addition, the site bordered on the west edge of the core of the Central Business District and being convenient to the major hotels, office buildings, department stores, and entertainment facilities, it possessed advantages as a garage site unmatched by any other site in or about the district.

Interest in the project gained momentum when in 1947, the State Legislature of Missouri provided its cities with the legal right to acquire property, construct parking facilities, and to operate or lease such properties to private operators for parking purposes. The right to use condemnation procedures for acquisition and to issue revenue or general obligation bonds for financing was also granted.[2] In the same year the voters of Kansas City authorized the issuance of general obligation bonds in the amount of $1,250,000 for the specific purpose of acquiring and developing the site for use as a parking facility.

The architectural firm of Gentry and Voskamp was then retained to prepare plans for a parking garage on this site. The completed plans presented an underground structure providing for three levels of parking and a landscaped park area on the surface level. The design of the surface level of the structure and the relationship of the site to the Auditorium and the Central Business District is shown pictorially in Figure 1.

[2]Revised Statues of Missouri 1949, Sections 71.310 and 71.360.

Fig. 2
Site excavation for garage.

The plans received immediate approval and proceedings were initiated to acquire the site but progress was again delayed by two court actions challenging Kansas City's right to condemn land for off-street parking and its right to issue revenue bonds to finance such facilities. When the actions were finally adjudicated by the Supreme Court of Missouri in favor of the city, acquisition proceedings were continued and the entire site was purchased at a cost of $2,000,000.

Concurrent with these proceedings, the Traffic Department was preparing plans and collecting data relating to the parking and traffic characteristics of the district. The engineering firm of Wilbur Smith and Associates was retained to prepare a report on the feasibility of this project and to conduct a comprehensive study of parking needs throughout the Central Business District. The study provided data important to the garage site and revealed that by 1955 the space demand potential to the garage would more than equal the proposed capacity of the facility. In addition the financial analysis of the facility presented an economic picture which was conducive to the issuance of revenue bonds in an amount sufficient to support the construction and financing costs.

Bids were then received by the city for the construction of the garage and the removal of the remaining buildings on the site. Low bids totaling $3,262,250 were received for the clearing of the site and the construction of the garage. Revenue bonds in the amount of $4,100,000 were issued to cover the expenses of demolition, construction, engineering, financing, interest during construction and other costs incidental to the project. It is important to note that these revenue bonds will be retired solely from the income derived from the parking charges of the garage. Existing state legislation requires that no services other than parking may be dispensed at a municipal facility of this type.

Construction of the garage began on March 1, 1954, and it is scheduled for completion by September 1, 1955. In July, 1954, the excavation work on the site was substantially complete and work on the pouring of footings for the structure was in progress. Figure 2 shows the excavated site and its relation to the Municipal Auditorium and other buildings in the Central Business District.

The garage which will have a total area of 389,187 square feet and a capacity of 1200 parking spaces will serve an estimated 3200 vehicles on an average week day. The close proximity of hotels, eating facilities, and department stores will create a high mid-day parking demand. In addition to the parking demands of the Central Business District, it will serve the needs of the Municipal Auditorium. The Auditorium which attracts an average of 1,900,000 per-

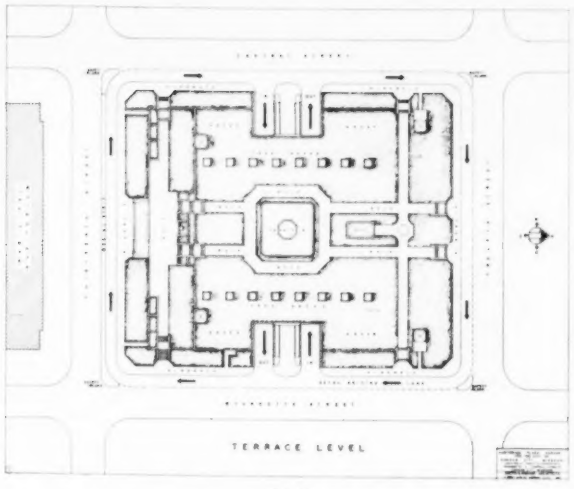


Fig. 3
Terrace level plan, Auditorium Plaza Garage.

sons annually is a parking generator of considerable magnitude and not only will it supplement the daytime parking demand of the Central Business District but it will also produce a substantial evening parking demand. This will result in a favorable space usage of the garage extended over a long period of each day. The rate schedule suggested for the garage is comparable to that charged by privately owned facilities in the area.

As can be seen from the terrace level plan of the garage (Figure 3) the structure will occupy an entire city block which measures 367 feet by 450 feet, the longest dimension running north and south. In addition to the provision of three levels of underground parking, the facility will have an attractive landscaped park area on top. Vehicle entrances and exits to the main level of the garage are provided on Central and Wyandotte Streets at the center of the block which are points least subject to traffic interference. To supplement the existing street capacity, a driving lane is to be provided which will also facilitate the movement of garage traffic and will allow the individual driver his selection of streets to approach or leave the garage.

Pedestrian entrances and isles are arranged in a manner which will eliminate the necessity of crossing major vehicular traffic lanes within the garage. Pedestrians may enter the garage from Wyandotte Street, Central Street or 13th Street on walks which lead directly to the waiting room at the center of the building or they may enter from an escalator leading from the park area above. A pedestrian tunnel under 13th Street connecting the Municipal Auditorium with the second level of the garage is also provided. Two sets of escalators near the waiting room on the main level will carry pedestrian traffic to and from all levels of the garage. The escalators are reversible and their direction may be changed to double their carrying capacity for peak in or out periods.

A plan of the main level of the garage (Figure 4) shows the pedestrian facilities provided on this level. Also illustrated is the parking arrangement and the traffic circulation plan for this level of the garage which is representative of the arrangement on the other two levels. The plan provides for one-way driving lanes with traffic moving in a clockwise direction whether entering or leaving the facility. Column spacings are suitable for the utilization of 60 degree angle parking and allow for three stalls per bay in the wider direction. Parking isles will be slightly over 17 feet in width and principal circulation isles will be 29 feet in width.

It is anticipated that this facility will be required to handle heavy peak surges of parking and unparking demand, principally those generated by events at the Municipal Auditorium. As a means of providing expeditious and economical service during all periods including those of peak demand, a method of operation utilizing customer parking is contemplated. The parking stall and isle arrangement previously discussed is designed to provide for ease of parking a vehicle by the customer. Upon entering the garage a vehicle will be stopped only long enough so that the driver may receive a parking check and directions to the proper parking level. Attendants will be employed on each floor to direct the circulation of traffic and to assist drivers parking their vehicles. The driver and passengers may then leave the garage by escalator and walkways to their destination. To pick up a car, driver will present his ticket to the cashier located in the waiting room at the center of the main level and pay the parking rate indicated. He may then proceed to his car by escalator and walkway and exit from the garage without further delay. The design of the garage is flexible enough to also provide for attendant parking should this method of operation prove more desirable.

Upon completion of the structure, the Traffic Department will assume complete responsibility for its operation and control. Plans are now being formulated on alternate methods of operation pending a policy decision on whether the garage will be leased to a private operator under the supervision of the Traffic Department or whether the Department will assume all phases of its operation and control.

In addition to the Auditorium Plaza Garage, another off-street parking facility will soon be available to parkers in the Central Business District. This development, known as the Northside Terminal Parking Project will provide 1800 off-street parking spaces and is located in the area bounded approximately by 6th and 9th Streets on the north and south and Walnut and Baltimore Streets on the east and west. Although this project is not part of the Traffic Department's program, its planning was so coordinated as to dovetail with the overall needs of the district. The area is being developed as a slum clearance project under the auspices of the Land Clearance for Redevelopment Authority under the Title I

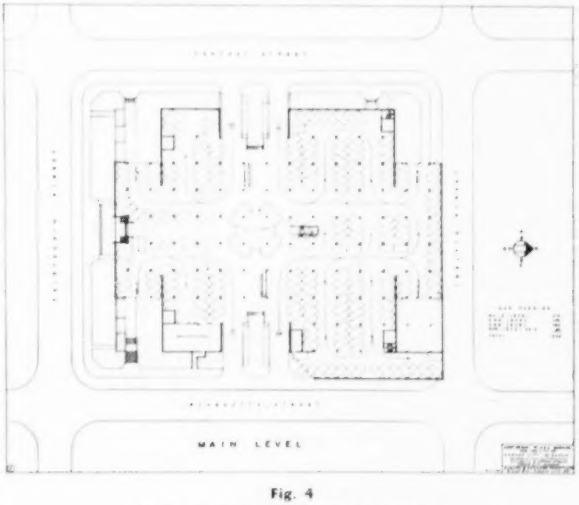


Fig. 4
Main level plan, Auditorium Plaza Garage.

provision of the Housing Act of 1949. An organization of business interests known as the Downtown Redevelopment Corporation will undertake the development of the site. In addition to the provision of 1800 parking spaces in open deck structures and surface level lots, the construction of several commercial facilities is also contemplated. Operation of the facility is scheduled for the Fall of 1956.

With the Auditorium Plaza Garage and the Northside Parking Terminal Projects becoming actualities, work continued on the analysis of the parking data to determine the block locations and magnitude of parking deficiences still in existence and those potential in future years. It has been determined that the eastern sector of the Central Business District will be in need of additional facilities to provide a well-balanced distribution of off-street parking spaces. Several sites in this area were investigated as to their demand potential, economic feasibility, pedestrian and vehicular access, and other characteristics. Selected as the site which is most desirable from the standpoint of parking demand and economic feasibility is one located in the block bounded by 10th and 11th Streets and McGee and Oak Streets. Figure 5 shows the location of the proposed site in the Central Business District and its relation to the Auditorium Plaza Garage and the Northside Parking Terminal Project. It can be readily seen that these facilities are located so as to have a minimum competitive effect upon one another.

The proposed east side site measures 128 feet by 265 feet and would be adaptable to the construction of an open deck structure with a sloping floor design. Preliminary plans indicate a nine level, staggered floor structure (equivalent to $4\frac{1}{2}$ floors) having a capacity to park approximately 450 vehicles. It is estimated that by 1958, the parking demand potential to this facility would be sufficient to economically support its operation. The plans for this East Side Garage are only preliminary and definite procedures have not been established for site acquisition, construction, or financing.

The work of the Traffic Department relating to the provision of needed off-street parking has not been confined solely to the Central Business District. It has been recognized that the business, recreation, and shopping needs of the city are also served by the intermediate or community business districts which generate heavy concentrations of vehicles. When many of these older centers were developed, the need for adequate parking facilities was not recognized, thus producing an acute parking problem under present day demands. The Traffic Department has been working with groups of property owners and merchants associations in an effort to provide additional off-street parking for these areas. While many groups are willing to finance the cost of the necessary facilities they are confronted with the inability to assemble many small, individually owned parcels of land to provide a site of suitable size for parking development.

It was recognized that the city, through its power of eminent domain, could materially assist these groups in acquiring suitable sites. When requested by an interested group of merchants or property owners, the Traffic Department conducts the necessary studies and prepares a report which appraises the need for such facilities, the appropriate limits of a benefit assessment district, location and design of the facilities, cost estimates and methods of financing. In addition to the close cooperation with the interested groups, the Traffic Department receives the assistance of the City Plan Commission staff and the Director of Finance in working out the details of these projects.

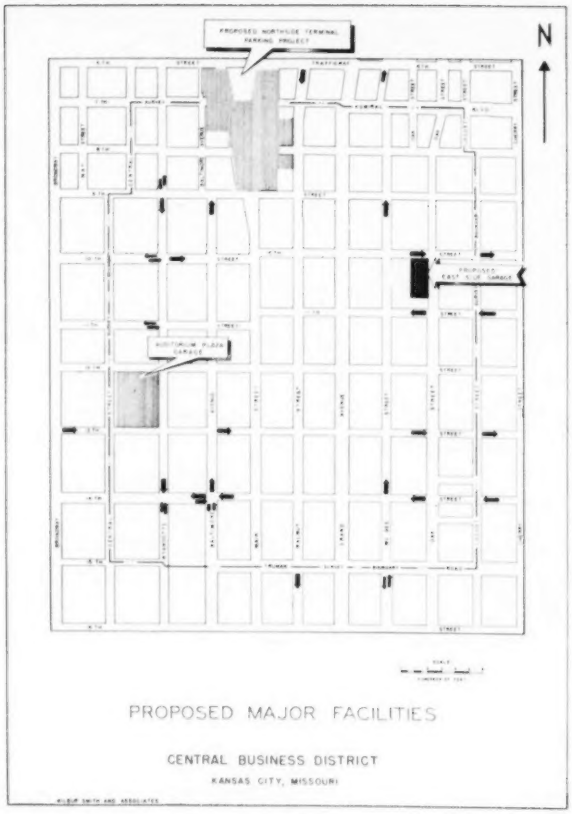


Fig. 5
Location of major facilities.

Notable progress has been made at one of these business centers known as the 31st and Troost District. A report prepared by the Traffic Department proposed the establishment of two off-street parking sites with a capacity to park 357 vehicles and the establishment of a benefit assessment district to pay the cost of acquiring the sites. It was further proposed that the sites would be developed as attractive parking facilities by the city and that a non-profit association formed by the area merchants would lease the facility at an annual rental sufficient to amortize the construction costs over a period of years and the cost of maintaining the facilities. The report was accepted with overwhelming enthusiasm by a majority of the merchants and property owners in the district and approval of the project was granted by the City Council. Ordinances have been passed clearing the way for early condemnation proceedings for the acquisition of the parking sites and the establishment of a benefit assessment district. This project is in reality a "test cast" and the knowledge gained in these proceedings will be invaluable in establishing parking facilities at other local shopping and business centers.

Although the off-street parking program in Kansas City is still in its infancy, considerable headway has been obtained over a period of relatively few years. It is hoped that this small measure of progress will be a stimulus for even further effort in the provision of off-street parking. This program on the part of the municipal government to provide a remedy to the parking problem is intended only to augment those efforts of private operators, merchants, and business organizations.

The Northside Redevelopment Parking Project

By Forrest D. Byars

Executive Secretary, Downtown Committee of the Chamber of Commerce
Kansas City, Missouri

Fig. 1
Architectural drawing of multi-level garage structure with subsurface parking to be constructed on Main Street. The garage will park approximately 884 cars.

ON JUNE 25, 1954, the City Council of Kansas City, Missouri, gave final approval to a proposed multi-million dollar off-street parking plan that has taken several years of cooperation between the City Plan Commission, the City Traffic Department, the Land Clearance for Redevelopment Authority, the Downtown Committee of the Chamber of Commerce and the Downtown Redevelopment Corporation to complete the preliminary planning. It is one of the major projects of the city's 50-million dollar program now under way to provide expressways, trafficways, and additional off-street parking for Kansas City.

The project calls for the development of a five block area between Delaware and Walnut Streets, except for some properties excluded on Walnut from Sixth Street to Ninth Street. The area also includes properties between Delaware and Baltimore Avenue from Sixth Street south to the Kemper Building as illustrated in the Site Plan.

The project will provide both multi-level parking garages and surface parking facilities for approximately 1835 cars and a new entrance to the downtown business district from the new Intercity Freeway, now under construction. The estimated cost of the redevelopment project is $3,435,000 and completion is expected by June, 1956.

The area presently contains 215 parking spaces. Parking rates will be established comparable with rates in the area which now range from a high of $1.25 per day to a low of $.50 per day. All property in the project will be owned by the Downtown Redevelopment Corporation and either be managed by the Corporation or leased to a private operator.

The beginning of the redevelopment project was in 1948 when a group of city officials made a tour of the area just north of the downtown business district of Kansas City, extending from Second Street to Ninth Street and from Main to Delaware Street, to familiarize themselves with the blighted conditions of that area. A program was started to rehabilitate the area in order to provide a new and more attractive entrance to the Kansas City business district from the proposed Intercity Freeway (Sixth Street Expressway). Much progress was made in an extended program to improve the streets, curbs and sidewalks in this area.

In 1950, the need for redevelopment of the northside area was established by studies and surveys made by various city departments, by housing data collected by Community Studies, Inc., by field inspections made by members of the City Plan Commission Staff and reports of various social and welfare agencies compiled since 1948. This information showed that the northside area is generally a "skid row" or "flop house" area and that many buildings in the area combine a commercial use on the ground floor with residential uses on upper floors when such buildings were not constructed or designed for residential uses, the result of which was inadequate entrances, poor lighting and ventilation, little or no sanitary facilities, etc., for those residing in the buildings. It was also discovered that the area carried a heavy load of the relief and welfare cases of the city and the cost of police and fire services for the area were unusually high in comparison with other areas in the city. Many old buildings in an advanced stage of physical deterioration, blight and obsolescence are in the area. As a result, this area constitutes a menace to the health, safety, morals and welfare of the citizens of the city. Rental and sale values have been subnormal for a number of years and tax delinquencies are common. For all of these reasons, this area has become an economic and social liability to the city and has hampered the development of adjacent areas for many years.

The studies were made in order to determine whether or not that area would apply under the Federal Slum Clearance and Urban Redevelopment Program of the Housing Act of 1949 as a slum area and thus enable the city to request capital grant funds to finance further study and redevelopment of this slum area.

It was suggested to the City Plan Commission that the area from 6th to 9th Streets, Main to Delaware Streets, could be developed as an off-street parking terminal for approximately 1,000 cars and as well, provide a new and more attractive entrance to the downtown business district of Kansas City from the Intercity Freeway. The plan would be to tear down all existing buildings and provide both multi-level structures and surface lots for off-street parking.

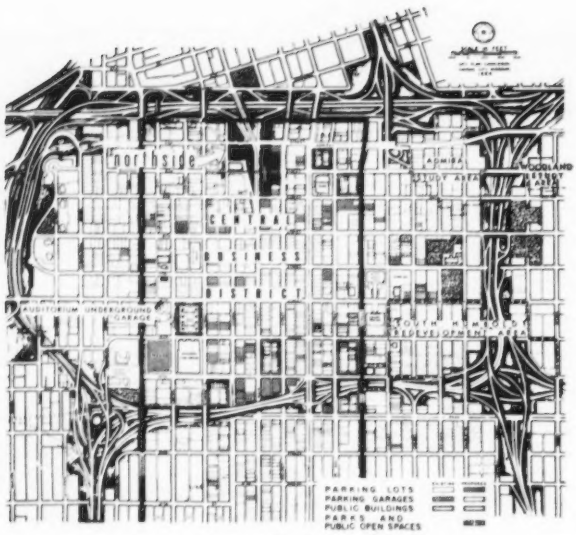


Fig. 2
Northside Redevelopment Project and the Downtown Master Plan.

The City Plan Commission took the suggestion into consideration and review, to determine how much such a development would cost the developer. The City Plan Commission Staff, with the assistance of the Traffic Department and other City Departments, made a report on the feasibility of such a plan. When it was decided the plan could be carried out, the City Plan Commission gave preliminary approval to the idea of the northside parking terminal.

The preliminary studies of the area as a whole, including the northside parking terminal, were submitted to the Slum Clearance Division of the Housing and Home Finance Agency, Washington, D. C., for their consideration. They approved the area as a slum area and the city's request for capital grant funds in the amount of 2½ million dollars was granted under the Title I Program of the Housing Act of 1949.

The City Plan Commission then recommended to the City Manager and City Council that the city apply to the Housing and Home Finance Agency for an advance of $45,800 in planning funds to make the necessary studies, appraisals, etc., for the northside parking terminal and several other slum clearance sites. The City Council approved the recommendation, and the justification for the request and the application were sent to the Housing and Home Finance Agency. The Agency approved the application for the advance in the planning funds.

Under the Housing Act of 1949, the federal government will advance funds for the city's purchase of a blighted area, which will be cleared of its buildings and sold at a "write-down" cost to a private enterprise for redevelopment. The difference between the cost price to the city and the selling price to the corporation is made up one-third by the city and two-thirds by the federal government. The city's one-third share of the cost can include such improvements as streets, utilities, and other betterments which will reduce the actual cash outlay on the part of the city. The loans for the advance planning become a part of the cost of the project. The price paid by the redeveloper is based on an appraisal for the new use of the land to conform to the redevelopment plan. The redeveloper will be required to pay full taxes on all of the Title I properties.

While the city was obtaining approval for the advance funds from the federal government, the Downtown Committee, with the assistance of legal counsel, had been investigating the various redevelopment laws of the city, state and federal governments, with the idea in mind of forming a redevelopment corporation to purchase the necessary property from the city that is required to carry out these plans. The redevelopment laws make certain inducements to private investors to undertake slum clearance projects both for housing and commercial purposes.

Under the Urban Redevelopment Corporations Act of Missouri, the net earnings after taxes of such a corporation are limited to 8 per cent per annum. Surplus net earnings in excess of 8 per cent may be held by the corporation as reserves for maintenance of such return in the future or to offset any deficiency in the rate of return in prior years, to accelerate the amortization payments or be used for the enlargement of the project or reduction of rentals. Also, under this Act, the corporation is to be assessed taxes on such part of its property as is acquired under the Urban Redevelopment Corporations Act of Missouri for the first ten years based on the assessed value of the vacant land at the time of acquisition regardless of how it may be later improved. For the next fifteen years, the tax assessments are to be limited to 40 per cent of the assessed value of the land and improvements.

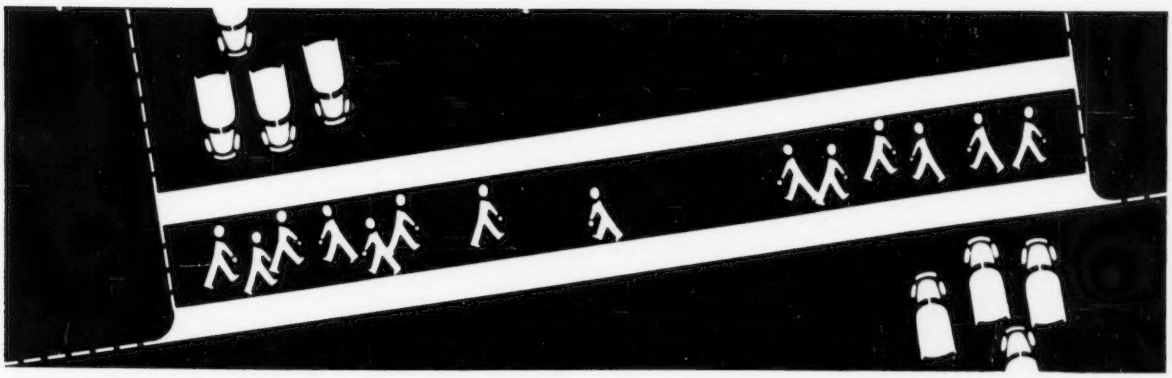
In cooperation with the Downtown Committee, the City Plan Commission and the Traffic Department, the first plans for the parking project were prepared by the firm of Hare and Hare, City Planning Consultants. Numerous meetings were held to review the preliminary plans and to make the necessary and suggested changes to smooth out the plan. One major change was to extend the plan to include a connection from Main to Walnut Street in the 700 and 800 block.

Desiring to know how the plan for the parking terminal and redevelopment corporation would be received by downtown businessmen, the Downtown Committee held a meeting with various city officials, downtown merchants, property owners, and representatives of various civic and welfare organizations in attendance and presented the overall plan for the parking project and the organization of the redevelopment corporation. The plan was well received and the businessmen indicated a willingness to cooperate as much as necessary to improve the downtown parking problem.

Then, in August of 1952, Kansas City voted 1½ million dollars in bonds to pay the city's share of slum clearance projects, which indicated that the Kansas City voters were behind the redevelopment plan.

Using that as a spur, the Downtown Committee organized the Downtown Redevelopment Corporation on September 17, 1952, with capital stock of 1 million dollars at $100 per share par value. Because of the Intercity Freeway being built adjacent to the project area causing property values to go up considerably since it was started, it has been necessary to increase the capital stock from the original incorporation of 1 million dollars to 2 million dollars. Subscriptions have been obtained for the purchase of stock in excess of $1,500,000.00 to date from our local merchants, building owners, banks, hotels, and other downtown business interests.

In November, 1952, Mayor William E. Kemp was authorized by the City Council to appoint a five man Land Clearance for Redevelopment Authority of Kansas City under



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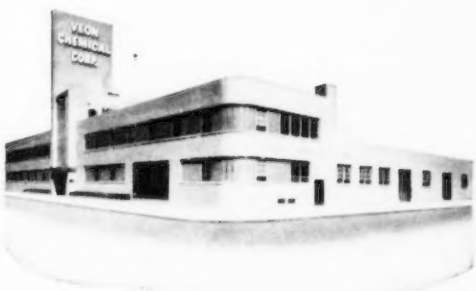

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the provisions of the existing Land Clearance for Redevelopment Authority Law of the State of Missouri.

This Redevelopment Authority was formed to act for the city in purchasing and clearing the blighted areas to then sell the property to a private enterprise for redevelopment. The first meeting of this Redevelopment Authority was held in January, 1953.

The City Council in January, 1953, passed an ordinance authorizing city officials to make application to the Slum Clearance Division of the Housing and Home Finance Agency for a final advance of $33,688.00 for surveys and other activities necessary to undertake such a project as the northside off-street parking terminal, and to submit the boundaries and planning schedule of the project for their final approval.

The request for advance funds was granted in the amount of $26,786. The city approved the contract from the federal government for the final advance funds and the Redevelopment Authority made the necessary studies to compile their Redevelopment Plan for the northside area as a whole and then submitted it to the City Plan Commission. The City Plan Commission approved the Redevelopment Plan, stating that it conformed to the city's Master Plan even to the proposed off-street parking. It was then submitted to the City Council for their approval and in September, 1953, it was approved. The approval of the parking project by the Housing and Home Finance Agency was received on December 22, 1953.

The Downtown Redevelopment Corporation, had in the meantime, with the assistance of Keene & Simpson, Architects, been preparing the Development Plan for the North-

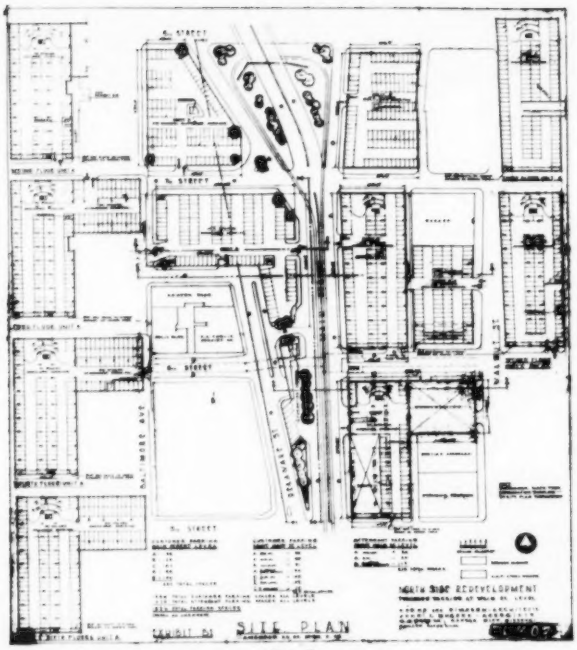

Fig. 3
Site plan of Redevelopment Project parking facilities.

side Parking Terminal to be submitted to the City Plan Commission. The Plan Commission reviewed the plan and held a public hearing on March 22, 1954, at which time all those interested in the plan could speak for or against it. The Plan Commission suggested several amendments and the Downtown Redevelopment Corporation amended the plan accordingly. With the approval of the City Plan Commission, the plan was submitted to the City Council. A hearing was held before the Finance Committee of the City Council and the plan was approved by the City Council on June 25, 1954.

The Redevelopment Authority has now acquired the thirty-four parcels of land that fall under the Title I Program. The Downtown Redevelopment Corporation is in the process of acquiring either by negotiation or condemnation under the power of eminent domain — whereby the city grants the Corporation a certificate of public convenience and necessity, authorizing it to acquire the property by the exercise of the power of eminent domain — and without the federal "write-down" provision, eighteen additional parcels of land needed to round out the general plan.

Bids were taken on the properties acquired by the Redevelopment Authority on July 29, 1954, and acceptance of the Downtown Redevelopment Corporation's bid of $466,500 has been recommended.

The Missouri Supreme Court on July 20, 1954, ruled the Urban Redevelopment Project legal as to the right of condemnation by the power of eminent domain. This gives the final green light to the project which now has the city, state and federal "go ahead."

Although it has taken several years to develop the preliminary plans for the parking project in connection with the new Intercity Freeway, we believe that the time element has been well justified as this project is an excellent example of how traffic engineering, city planning, redevelopment, city government, and private business can work together to assist in solving the downtown parking and traffic problems.

Transit is Tied Up in Traffic

By G. H. Frieling (Mem., ITE)

Vice-President in Charge of Transportation, Kansas City Public Service Company

Fig. 1

One-way traffic on 10th Street showing bus loading zones at Main Street.

AS FAR BACK as our history takes us there has been the the need for transportation. The resultant traffic problems of long ago appear minor in comparison with the congestion of today but they no doubt troubled the people of that day, too.

The history of transportation is an interesting one. When the human body was not only the motive force but also the carrier, there was not much need for roads and the movement was slow and burdensome. The first use of animals for transportation took the load off man's back but the amount of goods or the number of persons they could carry was still comparatively small. Some people travelled in comparative luxury in the sedan chair, but except for a well-attended party in the courtyard, I don't suppose there was a great deal of congestion.

When the sled, or some such contrivance, was first invented, and pulled by oxen, or similar animals, transportation no doubt took great strides forward. It led to the development of the solid disk wheel, first, and later to the more advanced types. The need for roads was here. Large amounts of goods and many people could be transported in a single carriage. And so transportation moved steadily onward in peace and war. Napoleon wrote much about the part transportation played in his campaigns.

But with this advancement came the problems of congestion, storage, speed, accidents, more and more highways, super-highways, expressways, speedways with higher and higher costs, and many other traffic problems which are so familiar to us today.

Much of our problem has been the result of the increased use of the automobile in this country. There was a halt to their manufacture and use during World War II but registrations have skyrocketed since that time. It has been said that we are becoming a very "soft" nation because we use our auto for even the shortest trip and thereby neglect our walking.

Nevertheless the automobile has been a wonderful invention. It has allowed the masses to have freedom of movement and to go places that were only distant spots to them before. It has allowed for more freedom in the conduct of certain types of business. It has become a part of our American way of life. But it has grown so big that much of our freedom of movement is being lost. It is choking our streets — the lifeline of our cities. Much auto use has been shown to be highly inefficient in use of street space. The effective use of all forms of transportation is out of balance. A change in operation and some restrictive measures therefore appear to be in order.

It is generally conceded that the auto is a most uneconomical user of street space. On the basis of a normal average number of persons per auto, the carrying capacity of a modern bus could replace from 30 to 40 autos. Yet, even with shiny new buses of modern design and with all the new innovations of construction, the people are not being attracted to the transit vehicles in large enough numbers to make most systems show a reasonable profit. One of the main reasons why this is true is because the speed of the transit service is not sufficiently attractive. Yet, it is the large number of autos congesting much of the transit route that is causing the slow speed. In fact, the average speed per mile is in many cases less today than it was when transit had the old, obsolete, slow equipment. Certainly the modern transit vehicle could maintain an attractive service if its movement was comparatively free.

This is a matter that must receive the serious consideration of all Traffic Engineers and City Planners, as well as transit men, because of its important effect upon the Central Business District. It is generally agreed that that area is a most important section in the welfare of any city. It is a district that depends on people — lots of them — whether they are there to work or to buy goods or services. Businessmen therefore have a very important stake in public transit. It does not concern them how many vehicles enter that district or whether the street is blocked solidly with them. They want people. It is people, not vehicles, that create business. And it is public transit that can most easily bring large numbers of people into the business area with the least amount of congestion on the streets. The more private vehicles that are brought into the district, the more space will be required to store them, and thereby use valuable space that should be used for other business.

In an expanding city, shopping areas other than the downtown district are bound to develop. They should so develop for the good of the city as a whole, but as cities are presently constructed, it is still a good plan to keep the downtown business area as healthy businesswise as possible. The high property values can only be maintained by a high sales volume. To gain that the area must be easily accessible to a large volume of people. Thus to best protect the investment of the businessman, a proper balance must be sought between transit and other traffic.

It would, of course, be foolish for me to suggest that transit only be allowed in an area of heavy business activity. The auto has become a part of the American way of life and it should be used where its use is feasible. It is becoming necessary, however, to place more restrictions on its use. These might include the following suggestions to secure the proper balance of transit and other traffic usage.

1. Prohibit all on-street parking in the business district. The street space is too valuable for the movement of traffic to allow it to be used by a comparatively few parked autos. An old saying from England is that "The King's highway shall not be used for a stableyard." That still holds good today if we may here refer to the principal streets of the city as the "King's Highways."

It has been observed that twenty autos parked along a two hundred foot block — ten on each side — can block the passage of as many as five hundred vehicles an hour. This nearly cuts in half the normal traffic flow. The fact is that even one or two parked cars can cause all the others in that lane to swing out into the next inside lane and thereby not only lose the effectiveness of the curb lane, but it also slows up the movement in the inner lane by the cutting into it.

As an example of the carrying capacity of a street, let us take a 60 ft. pavement which, with no parking, provides three traffic lanes in each direction. It has been estimated that if the street is used entirely by automobiles, it has a capacity of 2,115 vehicles per hour which, at the average of 1.75 persons per auto, would carry 3,700 people.

If one lane is used by buses or street cars, the number of autos is reduced to 1,215 per hour, which at the average of 1.75 per auto, would carry 2,130 people. If the other lane was used by 180 transit vehicles per hour of 50-passenger seating capacity, they would carry 9,000 people. Thus it is seen that even allowing for a seat for every transit passenger, the number of people the street can accommodate is greatly increased, with fewer vehicles, if transit is used effectively.

More than a year ago the City of Philadelphia took the bold step of prohibiting on-street parking in an area of 112 blocks in the city center. It was accomplished by the cooperation and public support of many interested groups. Some may have had doubts of its success at the time and had their fingers crossed but the results have convinced them of their action. The speed of the public transit vehicles have been increased 27 to 40 per cent. The speed of autos and trucks has been increased 42 to 51 per cent. Philadelphia is to be complimented on showing us what can be done when there is a will to do it.

2. Prohibit on-street parking on all main thoroughfares used by transit vehicles. These streets are usually the main arteries leading into and out of the central district. The job is only partly done if we open up the downtown area but then choke the traffic as soon as it leaves that district. Many of these streets allow for only one moving lane in each direction when the curb lane is used for parking. The amount of traffic demands more moving lanes, especially in the peak periods, if a smooth flow is obtained and back-ups avoided. Street widening is often most difficult and economically unjustified.

It is quite possible that on some streets, and particularly those some distance from the congested principal business areas, it would not be feasible to prohibit all on-street parking. In those cases it is important that bus zones of sufficient length to allow easy pull-in and pull-out by the buses be established at transit stops. It is a good policy for the traffic engineer and transit official to have agreed in advance on a standard length for bus zones for the various types and

lengths of equipment; single, double or triple berth zones; or near side, far side or center of block zones.

3. Zone some streets for the use of transit vehicles only. Recent surveys still show that transit carries a majority percentage of shoppers to and from the central shopping area, and an even higher percentage of workers. It is imperative, therefore, that something be done to take these large numbers of people out of the slow line of traffic congestion.

4. More express service should be developed for transit. The elimination of on-street parking on transit routes out of town, and the designating of separate streets for transit, will allow for a much better system of express service by transit companies. As people move farther out, such service is a necessity if the running time is to be held to reasonable limits. It will allow for a system of zone fares which must come with such decentralization.

5. Establish fringe parking lots. This is a means of allowing many people, especially the long distance travellers, to drive their autos most of the way, if they so desire, but still keep them out of the congested central district. It is preferable that these lots be of comparatively large size so as to accommodate at least 500 to 1,000 autos and served by either main line or shuttle transit service. It has been proven economically unwise for the transit company to provide such lots, but it may prove to the best interest of the city for it, or some other benefited groups sharing the cost with the city, to provide such parking areas. Some restrictive measures might be necessary if the congestion indicates that there are too many close-in parking lots and garages.

6. Prohibit on-street loading and unloading of trucks in the important business areas during the peak traffic periods. It is imperative that the store traffic managers arrange their incoming and outgoing schedule so that the truck movements will not coincide with the rush period demand on the streets. In some areas it may be advisable to institute parking restrictions for an hour or so after the rush period to allow for parking of trucks only and thereby facilitate the loading and unloading of goods.

It has been estimated that before World War II, Detroit figured its congestion losses at $10,000,000 a year. In the garment manufacturing district of New York City, the cost of doing business is increased a million dollars a day by the delays in getting materials in and finished products out. St. Louis set its losses from congestion and accidents at $125,000 a day. Boston was said to be losing $40,000,000 a year in trucking business because of traffic conditions.

7. Promote rapid transit facilities wherever they can be used to good advantage and shown to be economically justified. They might be in the form of subways, elevated structures as we have known them, or monorail, conveyor belts, rail service on present railroad rights-of-way, or as heretofore stated, express service over streets on which transit vehicles only operate. It all adds up to getting large numbers of persons out of the congested areas much faster than they are now accustomed to getting out. If transit is to continue to attract large numbers of persons to its service, and if it is to really do the job for which it is designed, it is imperative that a system of operation be developed, and soon, that removes its vehicles from the presently congested pack where they are subject to many unnecessary delays, and puts them into a preferred channel of fast service. In addition to the tremendous advantage that such a system would offer the transit patron, the present sick treasury of the transit company would be helped greatly by such a plan through de-

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creased running time per trip and thereby less operating costs.

8. Transit service should be tailored more to the periods of the day and days of the week than it has been in the past. When transit operation was much more of a monopoly than it is today, it was of course natural that all lines be operated pretty much the same way all hours of the day and night, except for increased service in the peak periods, and every day of the week. The automobile, television, decentralization and the motor bus have all had a part in bringing about a great change. It is questionable whether any, or at least a large part, of the so-called owl service is justified. The night and Sunday service on many lines should be either discontinued or greatly curtailed. It seems unnecessary to run as many lines into the central business area on nights and Sundays, when that area is mostly deserted, as during the peak travel periods. It may prove best during those times to radiate only a few of the most important trunk lines from the central area to the outlying sections, and at strategic points thereon, connect with shuttle buses to the in-between areas on the basis of need or patronage demand. This would cause some additional transferring but schedules could be designed to allow for direct transfers. It is just as wasteful for a transit company to run a lot of service that is not economically used as it is for a merchant to stock twice as much perishable fruit as he knows he will sell.

9. Separate lanes for rapid transit should be built as a part of all newly constructed freeways and expressways. There will, of course, be a cry of opposition from some quarters to this proposal but the economics of the proposition proves its soundness. The addition of the transit lanes to the structure adds only a small percentage to the cost but has the possibilities of carrying a larger percentage of the people. The construction of a six or eight lane expressway leading into the central district only encourages the drivers of so many more vehicles to use it, which adds to the already congested central district where the storage problem is now acute. It is better to build for a balance in transportation.

There are many so-called "must drivers" of autos. These include the doctors, travelling salesmen, service technicians and others who must use their auto on many routine or emergency calls throughout the day. The regular traffic lanes should be left open to them. When the other auto drivers see the modern bus whiz past them in the transit lane they will be most encouraged to change their travel habits and ride by public transit. They will welcome the opportunity to get out of the traffic snarl which they have helped to create. As many of them so change their travel habits, the "must drivers" will find driving much easier in their traffic lanes, the parking situation in the central district will be greatly improved and the balance of travel between the autos and transit vehicles will be beneficial to all concerned. In fact, I doubt if many cities can long afford the cost of as many miles of expressways as all auto drivers think they need. Even if a substantial part of the cost is borne by the state and federal governments, the money can come only from the the taxes collected from the people themselves.

In conjunction with the building of separate transit lanes in expressways, bus bays should be built at reasonable intervals, or at strategic locations for efficient operation and for the benefit of the passenger. Depending upon the location of the transit lane, a safe access should be provided the passenger.

If it is estimated that the volume of transit passengers in either direction over an expressway is now or will be in the foreseeable future equal to or in excess of the maximum capacity of one lane of autos, a separate lane for transit should be provided. The separate lane can be provided at a moderate cost at time of expressway construction, and the cost would seem especially low when considered in relation to the potential of passengers it can possibly serve merely by increasing the size of transit vehicles used.

10. Many of the foregoing measures will contribute greatly toward the solution of the traffic accident problem.

Over the years the transit official and traffic engineer alike have been deeply concerned in the matter of accident prevention. The needless human suffering and enormous waste of property damage is appalling. The greater the congestion, the greater potential there is for more accidents.

During the last few years I believe transit companies have shown a somewhat better safety record than the cities as a whole. But there is much work to be done yet by both groups.

Most of our accident trouble can be laid at the door of the individual at the wheel. In comparison with the older models, the present day automobile has many safety devices and the mechanical failures are few. The streets and highways have greatly improved pavement with much better lane markings and highway markers. Heavy traffic intersections and dangerous places are marked by signal lights, "Stop" signs, "Caution" signs, or similar information or helpful devices. One might wonder how anyone could get into trouble. It may not be easy but through too much speed for conditions, weaving in and out of traffic, inattention to driving, and such other careless acts of operation, the driver causes an accident to happen. Some progress has been made in driver and vehicle inspection, driver training schools, financial responsibility laws and the like, but there remain many drivers on the streets incapable or unwilling to operate safely. A way must be found to improve these conditions.

In transit we carefully "screen" all applicants for operator's position through various testing procedures. He must pass a rigid medical examination, as well as a training period of at least a month both in the classroom and in actual road operation. Competent instructors teach him efficient and safe driving habits in the first instance, and at later periodic intervals he is observed by the instructors to see that his performance remains at a high level. A man who does not measure up to standard is recalled for more training. The operator's performance is further checked by a corps of road supervisors and dispatchers.

The transit equipment is the best available. It is maintained daily by expert mechanical personnel and periodically undergoes rigid inspection and overhauling. The efforts of these men aid the drivers greatly in maintaining a good safety record.

Over the years, the city of Kansas City has won many safety honors. The safety effort of the transit men in Kansas City has shown real results, too. In addition to local and national recognition of past years, the Kansas City Public Service Company was given the top safety award for 1953 by the American Transit Association among cities of the United States and Canada serving populations of 600,000 and over. It was also awarded a Special Citation for the greatest improvement over the previous year. And for vehicles other than street cars and buses, our fleet won first

place in its class in the Fleet Safety Contest for 1953 conducted by the Kansas City Safety Council.

It is our business to run many millions of miles over the streets of this city each year. We therefore have more than the normal opportunity for an accident. But our entire personnel feels a deep responsibility for the safety of the passengers on its vehicles and for safety of operation among all other vehicles. They want to do their part to keep this a safe city.

Those are some suggestions and there are no doubt many others because these are big problems.

The solution of the traffic problem will take a lot of unbiased, clear thinking and the possible inauguration of some bold measures by municipal officials. Let's look at it frankly. Most of us have become so accustomed to the use of the automobile that much of our travel-thinking is done in terms of it. Very few of us are closely associated with transit, just as very few directly work in any of the other specialized transportation fields. Isn't is logical then that the suggestions of transit men often fall on deaf ears as selfish suggestions for their own benefit only? It should not be so. Transit men must think in terms of people. All traffic experts should. Too many of them think more in terms of vehicles. Perhaps not purposely so, but they do it just the same and their actions reflect such thinking. Most of us should study well the expressions of some of our outstanding city planners and traffic engineers who have given this matter considerable thought. Here is what a few of them say:

Walter Blucher, former Executive Director of the American Society of Planning Officials:

"There has been too much thinking about the movement of automobiles rather than the movement of human beings. We could facilitate the movement through improving mass transportation facilities if we give mass transportation a chance, but nowhere are we doing that. We insist upon better mass transportation facilities, while we are at the same time spending public funds to provide competitive facilities which make improved mass transportation impossible."

Harland Bartholomew, noted St. Louis City Planner:

"The greatest stabilizing factor in central business districts is mass transportation. * * * It should be evident to all who are genuinely interested in the present as well as the future welfare of our cities that the streets of our central business districts should be cleared for expeditious mass transportation flow, regardless of whose individual interests are involved or whose toes may be stepped upon."

George Goodwin, Executive Director Central Atlanta Improvement Association:

"I notice a growing tendency on the part of all cities — to emphasize the automobile at the expense of the transit vehicles. * * * A much wiser approach is to have those who spend Monday working on the expressway and Tuesday working on parking to be sure they spend Wednesday serving the people who use mass transportation. (Incidentally, they will then have spent all three days serving the owners of downtown property.) I submit that these three — streets and expressways, parking and mass transportation (and taxis must be considered as mass transportation) must always go together. If any one of the three gets too far behind — or too far ahead — no solution can ever be reached."

(Continued on page 491)

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A Parking History of the Country Club Plaza

By Davis K. Jackson

Assistant Vice-President, J. C. Nichols Co., Kansas City, Mo.

IN HIS ORIGINAL CONCEPTION of the Plaza the founder of our Company, Mr. J. C. Nichols planned for off-street parking lots even though at that time, over 30 years ago, motor vehicle registration was only about one-fourth nationally of what it is today and suburban shopping centers were almost unknown.

These original parking lots using right angle parking are still in use today without change other than the widening of the individual car stalls. The so-called bay widths of 65 feet (distance from the front of the parked car on one side to the front of the car on the other side of the driveway), we feel are still proper and while we are inclined to the belief that diagonal parking is more attractive to the average customer, the physical layout of our lots combined with the habits formed over these years by our customers, has caused us to continue right angle parking in these particular facilities which can be seen in the center foreground of the aerial photograph.

The Company also spent substantial funds in grading the parking lots to a finished elevation of 12 to 24 inches below the street so that a pleasing vista across the lot is attained even though it is readily apparent that it is a parking lot. The photograph of one of these lots shows the extensive planting, the use of the masonry walls surrounding the lot, the lighting, signs and other features.

Fig. 1
Aerial view Country Club Plaza. The twin ribbons on left which appear to be an expressway actually are the two slopes of a paved drainage creek bed.

Because of the density of usage and the tremendous apartment developments that sprang into being around the Plaza limiting available ground area, it has become desirable since the war to construct multi-level parking facilities and the company now has three of those in use with an aggregate capacity of over 100 automobiles. These can be seen in the aerial photograph, one to the left center, one in almost the exact center of the photograph, and the third in the right foreground. The first two use diagonal parking with one-way traffic movements while the latter uses right-angle parking with two-way traffic flow.

It is the feeling of our Company that the public generally speaking prefers and can must more readily use diagonal parking arrangements with two-way traffic flows, however, we believe that in those cases where the physical requirements are such that this arrangement cannot be achieved that other layouts properly marked and carefully administered can be very usable and will prove satisfactory to the customers. Ingenuity must be exercised and it is our hope that many of those who attend the Traffic Engineer's Conference in Kansas City will look over these multi-level parking facilities since we feel that the peculiar shape of some of them and the unusual arrangements will be of interest.

All of our customer parking is based on the individual parking his own car and for that reason we have gradually increased stall widths from our original standard of 7 feet 6 inches to a standard of 8 feet 6 inches except in recent structures where in anticipation of future needs we are allowing 9 feet. We have had a rather unusual experience in the operation of the Neptune Parking Lot shown in the right foreground of the aerial photograph, where because of these rather unusual width stalls, people tend to be a little careless coming into the stall and end up in a slightly angular position. Because of the nature of this lot it is necessary to go back out the same way you came in, and such drivers are having some trouble getting out of the stall in order to go back in the direction from which they came. We expect to cure that to a certain extent at least, by the installation of a system of double lines marking the divisions between individual stalls. In general people show a tendency to observe the lines fairly well, particularly in our open air lots where we use a concrete button at each end of the line dividing the stalls. On the basis of our experience it appears that 2 per cent of the drivers do not park their car properly in the stall. We do tag such cars with the card shown here as a matter of education.

FOR YOUR ATTENTION

Your car as now parked uses up more than one parking space and in so doing, makes it impossible for another car to use this extra space.

We would be most appreciative if in parking again, you would observe the buttons or painted lines.

Thank you.

Country Club Plaza Association

Officer..... No.....

Fig. 2
Improperly berthed card.

Fig. 3
Open air parking lot.

Our Company has consistently followed the policy since we started the development on the Plaza of providing in our leases, that we may direct where the tenants and their employees shall park their cars. Originally that was principally a matter of insisting that they not park their car at the curb in front of any shop in the area, but gradually it has become necessary to ask that such parking be in certain parking areas or outside the Plaza. We value very highly the services as well as the patronage of the many loyal and hard-working employees on the Plaza and it is unfortunate that it is not economically sound to furnish all day parking every day in the most desirable locations for them. We do attempt to furnish every customer or patient space while they are actually on the Plaza in that capacity but beyond that we cannot go. This is brought home more forcibly when it is realized that in our multi-level parking construction, the cost of the individual car stall is greater than the value of the average automobile parked there.

Over the period since the war, we have developed rather detailed plans for the handling of our parking lots in order that they may be continuously and constantly available for the customers of merchants on the Plaza, and insofar as possible not available to anyone else. In the first place all of those lots except certain lots specifically designated for the use of the employees are chained off at 7:00 A.M. in the morning and the most of them kept chained until 9:45 A.M., 15 minutes before the normal shop opening. There are certain exceptions to this rule however, where we have a large super market, and in another case where the lot is opened at 8:45 but under the control of an attendant in order that the parking regulations aren't violated but so that early morning customers of beauty parlors and similar establishments may be accommodated.

Our attendants then go through the lots in the late morning and then again in the middle to the latter part of the afternoon counting the number of cars and marking tires with chalk sticks in order to determine who is parking in the lot all day. For those people who do park all day a very courteously worded little yellow ticket (shown here) is placed under the windshield wiper and if the same car

TO THOSE WHO PARK HERE

IF YOU ARE A CUSTOMER in one of our shops, offices, or a patient of our Doctors or Dentists, or simply visiting, we hope your use of this free parking space has been both pleasant and convenient.
IF YOU ARE A TENANT OR EMPLOYEE on the Plaza, it is requested that you park your car in one of the areas designated for employee parking. In so doing, you free this space for our customers and comply with the parking regulations. Thank you.

Country Club Plaza Association

Officer ..... No. .....

Fig. 4
Overtime parking card.

reappears consistently for long periods, then after it has received several of these tickets, a red ticket with the wording as shown here is placed on the windshield and if it is necessary to give more than a few of those then the police are requested to issue a ticket under the appropriate city ordinance for improper parking* Extreme care is taken to be sure that no customer is offended or improperly accused and with the kind of notice that is received through these cards, we have so far had no trouble in that regard. In addition these attendants carry on spot checking to apprehend those violators who shift from lot to lot and who occasionally park at the curb. Extensive records are maintained to avoid error and to keep us fully informed on individual as well as group parking habits.

WARNING NOTICE

This car has been parked substantial portions of the day in this and other customer parking lots and has been tagged with notices which call attention to the fact that this parking is for customers only and not for tenants, employees or others.
Because of these facts it is necessary for us to warn you that continued parking will result in your being issued a traffic ticket by the Police Department as provided for in Section 31-103.1 of Chapter 31 of the Revised Ordinances of Kansas City, Missouri.

J. C. Nichols Company

Attendant .....

Fig. 5
Final warning card.

Fig. 6
Entrance — Neptune multi-level parking.

Since the Country Club Plaza is famed in part for free parking, it is our desire to maintain that facility as long as possible and to make all of our facilities as attractive and pleasant for our customers as is possible. Our attendants being constantly in the lots are always available for answering customer questions, directing traffic, etc.

The Company likewise, from the beginning, has been acutely aware of the importance of easy traffic movement in the development of suburban shopping. In the layout of the streets in the Plaza, our Company established unusually wide rights-of-way and pavement widths and in most cases at our own expense, installed pavements varying from 60 to 70 feet. We did this for the additional reason that it would be possible to have diagonal parking on both sides of the street. Let no one forget that regardless of the theoretical considerations involved, the taxpayer and customer who drives his car still prefers to park at the curb and still finds it much easier to park in a diagonal stall rather than parallel. At the same time in order that traffic flows might be improved and expedited, we have cooperated with the City Traffic Engineer in a shift from diagonal to parallel parking. It is our hope that after careful analysis of the problems, we might maintain an enlightened opinion regarding such matters. We have also either at our own expense or jointly with the city, made adjustments in intersections, and widened existing streets, to expedite traffic movement.

We have benefited from the enlightened attitude of our city government as has all the citizens of Kansas City and we feel that anyone interested in parking and traffic in Kansas City, Missouri, has been particularly fortunate in the long period of service just now being concluded here by Thomas J. Seburn, City Traffic Engineer.

* In an effort to aid the developers of off-street parking facilities for free use of the general public, the City has adopted an ordinance making it possible for the Police to issue traffic tickets to persons who abuse the privilege afforded them of parking on such facilities. The provisions in this special ordinance are as follows:

"Section 31-103.1. It shall be unlawful for the driver of a motor vehicle to enter onto, stop, stand, or park such vehicle on vacant property or upon an area developed as an off-street parking facility, without the consent of the owner, lessee, or person in charge of any such vacant property or facility.

Section 31-126.1. If at any time a vehicle is parked in violation of the provisions of Section 31-103.1, the Police Department, upon complaint of the owner, lessee or person in charge, may, in addition to the penalty provided therefor, remove or cause to be removed said vehicle, keeping it in its custody or under its control, in accordance with the provisions of Section 31-126."

It is felt this may be a slightly new approach and may be of some interest in other communities.

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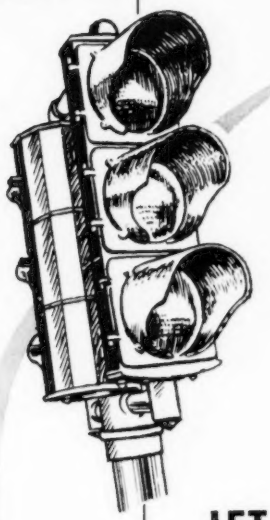

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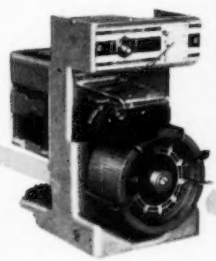

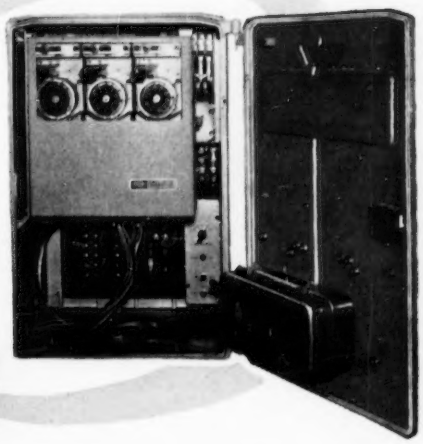

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Kansas City, Missouri Street Lighting Modernization Program

By Paul C. Box

Associate Member Illuminating Engineering Society
Lighting Engineer, Department of Traffic, Kansas City, Missouri

Fig. 1
Typical artery — before.

Fig. 2
Typical artery — after.

In April, 1946, Kansas City witnessed the first installation of new style street lighting equipment under its Modernization Program. The city at that time was lighted by approximately 13,400 old style electric lights ranging in size from 1,000 lumens to 15,000 lumens at 11 to 22 foot mounting heights. In addition, over 1,700 gas lights were located in the older residential areas. In the newer sections, more than 1,800 blocks of 600 foot length were provided with no interior illumination whatsoever. Approximately 300 intersections were unlighted.

Goals

The primary goals of our relighting program were to reduce traffic accidents and night crime activities. For several years past, the traffic accident experience had shown that with one-third of the total traffic using the streets during the hours of darkness, approximately three-fourths of the serious traffic accidents were being experienced. While the number of accidents is theoretically a function of volume, their seriousness is a product of driving conditions. Seeing ability is one of these conditions.

It was recognized that night driving presents special unpredictable factors such as drunken driving, to a greater degree than daylight hours. Nevertheless, by providing proper illumination intensities in accordance with recognized standards, the night accident rate and, consequently, the total number of accidents should be reduced. Of even greater value would be the reduction of death and injury mishaps.

With respect to night crime activities, comparative data was not available. However, certain types of crime activities such as car pilferage and molestations are normally carried out under cover of darkness and should be reduced by improved lighting.

Additional benefits of street lighting such as increased night usage of the streets by shoppers and entertainment-seekers had long been recognized by business interests. Our central shopping district and one outlying area had been provided with special installations paid for by the merchants and maintained at city expense. Thus, our job was to modernize the arteries and residential areas.

Contract

Since our existing electric lighting system was installed, owned, operated, and maintained by the Kansas City Power & Light Company, their counsel was sought in revising the contract. Favorable rates were secured by the city which made it financially possible to carry out the program without the necessity of either a bond issue or special assessment levy. According to data taken from light distribution curves of the type of equipment in use, our lights were producing a total of approximately 11,670,000 effective lumens of light on the streets and sidewalks of the city, the balance of the generated light being distributed sideward and upward where it was of little value to street users. Our cost per thousand effective lumens was running $47.50 with the electric equipment, and $135.00 for the gas lighting. Cost per thousand effective lumens with the new style all-electric equipment would average $12.80. Under the old contract, our annual street lighting bill averaged $588,000. After complete modernization, the estimated annual cost would be $625,000, based on the 1945 street mileage.

Of particular advantage was the contract provision making the program one of laying out an entirely new street lighting system, and not merely attempting to utilize existing circuits and poles. As a consequence, our layout procedure is basically independent of existing equipment, and the new locations are superimposed upon the old, rather than vice versa. All existing lights are of course, discontinued. Where new pole positions approximate existing ones, minor variations are made, depending on the remaining life expectancy of the old pole.

The only exception to this rule has been made on streets having trolley lines, where, in general, we attempt to base our layout on the trolley poles. The basic criterion has always been establishment of spacing ratios which lend themselves to meet future requirements of greater intensities by merely increasing lamp size and without necessity for pole relocations. Layout procedures will be discussed in more detail later in this article.

Initial Phase

In the beginning of the program, material and manpower shortages plagued the Power Company and, consequently, all available production was scheduled for arterial lighting. Accident studies were made based on a five-year history of nighttime accidents involving 106 fatalities. It was found that 84 per cent of these deaths occurred on 40 miles or slightly less than 25 per cent of the existing artery mileage. These routes were selected for first priority. It was felt the greatest good could be brought to the greatest number of our citizens in this way.

In addition, temporary lights were ordered at the 300 unlighted intersections. This, in effect, established a minimum level for residential lighting over the entire city.

By the Fall of 1947, these twin tasks were nearing completion, and advanced studies were made for relighting of the residential areas. In addition, the arterial program was extended to encompass our entire network of approximately 165 miles of through streets existing at that date. Continuation of this work was to run concurrently with the residential phase.

Perhaps the largest single problem we faced in residential areas (aside from rate of construction) was public relations. In the many areas lighted by gas lights alone or unlighted entirely in midblocks, decisions had to be made regarding use of overhead wire wood pole systems or underground feed and steel poles. Obviously, we were financially unable to support an entire underground system for these areas. We definitely did not feel the additional cost of underground installations should be borne by the abutting property owners. For one thing, existing underground feed areas had never been charged for this service. Secondly, the only extra service the city was prepared to give owners in high taxation areas was apparently ornamental street lights. The garbage collection, street maintenance, health and fire protection, and similar services is as evenly distributed through the city as possible, yet the land tax range varies greatly. We have not felt the owner of a $50,000 residence deserves any more street lighting quantity-wise than a $5,000 home-owner. In fact, the greater population density and attendant higher crime rate in the poorer sections of town generally warrant increased illumination over the prevailing city average. We are currently treating this as an individual location problem, having, by the program, attempted to give everyone the same level.

Use of land valuation maps provided a preliminary basis for breakdown between overhead and underground areas. Average front foot valuations of $15 and over were put in the underground category; $11 to $14 valuation was proposed for ornamental pole, overhead feed; and the remainder for wood pole overhead. Business areas obviously could not be classified in the above manner; consequently, existing circuit types were followed.

We have more than 160,000 trees along our streets and this foliage density curtailed the planned usage of ornamental pole overhead feed due to limited attachment space on the poles. Consequently, these areas were reconsidered and, in most cases, overhead feed wood poles were used at intersections, with underground wiring to midblock steel standards.

The second problem faced in public relations was scheduling of areas. A study was made of city-wide night crime activities for the past few years, and priorities established. This schedule was followed in general; however, the areas indicated for earliest relighting were of course those where overhead lights were to be used. The acute shortage of skilled linemen and estimators at that time, compared with the availability of the relatively unskilled labor used in the greater part of underground installations, forced some deviation from this plan. With the major underground arteries completed, residential areas were taken on by these crews. It was felt the best procedure lay in getting everything in service as soon as possible.

Special Problems

In addition to the lighting of the city streets under the program, certain problem locations existed where the use of conventional street lighting equipment was impractical. At 13 points, our mainline railroad cross-city route overpasses major streets. The structures are all of reinforced concrete and average 14 feet of overhead clearance. The presence of multiple rows of closely spaced columns and the impracticability of recessing into the old concrete, coupled with the very low required mounting height with its attendant glare and vandalism risks made this task back in 1948 a formidable one indeed.

Our solution was fluorescent lighting which has since been accepted as standard procedure. At that time, the only installation to my knowledge was the Kenwood Bridge in Salem, Massachusetts. This structure was lighted by a single handrail mounted row of continuous lamps in glass fixtures. Our cost would have been prohibitive to employ the necessary four to six rows using this type of equipment in our underpasses, even had the vandalism problem not been present. Actually, the fixture we designed was aimed primarily at vandal-proofing, consistent with correct light distribution and simplified maintenance.

We installed fourteen lamps as a test installation in one underpass in February, 1949. Twelve were cold cathode lamps, employed as an attempt to minimize cold weather loss of light output (which is no longer a problem — thanks to outdoor fluorescent lamp improvement).

One year's experience with this location indicated several improvements, both from the maintenance and vandal standpoints. The fixture was completely redesigned and, in October, 1950, 126 additional installations were made in the remaining underpasses. The new fixtures utilize twin .220 inch Plexiglas panels in the door, which is a floating mount on sponge rubber. The ability of this unit to absorb the

hail of rocks, bricks, and assorted masonry chunks which it seems to invite is little short of amazing.

Prior to 1949, our electric street lighting system was operated by time clocks providing a 4,000 hour annual schedule. The primary disadvantage of such a system, based on sunrise and sunset tables is failure to reckon with conditions of unusual darkness due to haze, fog, or overcast skies. After considerable discussion of the problem, engineers of the Power Company were asked to design a special photocell relay control. This installation consisted of four interconnected cells, mounted at scattered locations around the downtown area. A vote of three units operates the entire lighting system, with the exception of a few isolated circuits. This control went into operation in February, 1949, at a cost in excess of $8,000.

Initial setting provided for turnon at one footcandle, and off at .5 footcandles. After a trial period, the settings were reduced to .75 turnon and .25 turnoff.

By thus utilizing highly sensitive cells, considerable saving results when compared with the additional cost of providing safe control limits using standard cells. In the latter case, turnon levels of several footcandles would be required with attendant increased annual current consumption.

Progress

By the time these special installations were completed, considerable progress had been made toward the city relighting goal. The original arterial program was completed by December, 1950, with 8,300 lights installed on 168 miles of through routes. Annexation of a well populated area to the south, plus expansion of the arterial network due to increasing traffic volumes, enlarged the system to about 220 miles. Nearly 150 miles of residential streets had been lighted using 600 underground and 1,300 overhead lamps.

Through July of this year, 230 miles (10,800 lamps) of through streets have been relighted and 590 miles (7,400 lamps) of other streets. Approximately 75 miles of our streets remain to be relighted in the section south of the Missouri River and it is anticipated late fall will see this part completed.

In 1950, we annexed a large, rather thinly populated area north of the River. This area comprises about 120 miles of streets and, with the exception of two major routes through it, no street lights have been installed.

Mechanics of Layout

Layout procedure for the arterial lights has followed the basic recommendations as formulated by the Illuminating Engineering Society and the Institute of Traffic Engineers. Proper consideration is given roadway alinement, grades, and foliage, as well as traffic and pedestrian volumes. Unfortunately (from the lighting standpoint) many of our lesser arteries originally calculated with the specular reflective qualities of concrete have since been resurfaced with asphalt. It is acknowledged that this factor in conjunction with additional traffic volumes indicates the need for continuing studies and increased intensities. However, except in the case of street widening and attendant pole relocations, we have not attempted to keep pace with changed conditions. We are currently attempting to complete the basic program first, then follow along with the necessary adjustments.

With respect to residential layout procedures, experience has resulted in development of certain special applications based on our block pattern of a 330 by 660 foot grid. Initial installations employ 4,000 lumen lamps at 25 foot mounting heights. Type I two-way distribution luminaires are used midblock the long way with six, ten, or twelve foot brackets depending on street configuration and foliage conditions.

At intersections, twelve foot brackets are normally employed, canted approximately 45 degrees to the curb line. Type I four-way luminaires are used. Our standard unit produces two minor beams at five degree offset and symmetrical about the major beams. Special care is taken in layout to balance the light concentrations in all four directions from the intersection by use of spacing ratios, i.e., minor to major beam, major to minor, etc.

At "T" intersections, a special two-piece internal shield is fitted into the globe to partially block the house side beam, making this unit in effect a three-way luminaire.

Unfortunately, our arterial lighting program was practically completed before we recognized the need for special cross distribution at intersections of these routes with residential streets. We now provide a Type I unit at right angles to the main street, in lieu of one of the far right arterial luminaires. Standard spacing is continued across the intersection; the cross unit thus providing the additional illumination requirements for both intersection and side street.

Results

Various studies have been made by this office to determine the effectiveness of our street lighting program in reaching the objectives. One covered an analysis of 8,640 accident reports during the period 1946 through 1950. It included study of 113 relighted sections of traffic routes totaling approximately 97 miles. In view of the fact that the data were taken over a several year period in which many fluctuating conditions might effect direct comparisons,

(Continued on page 490)

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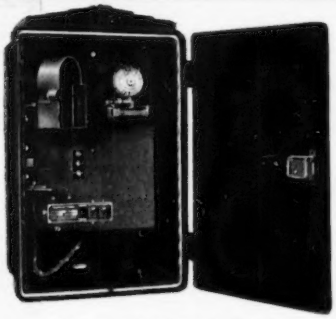
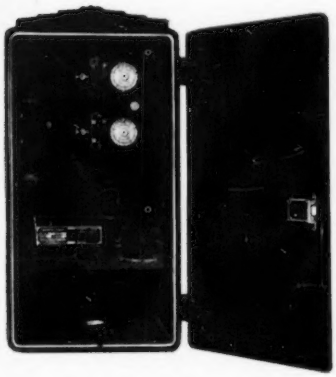
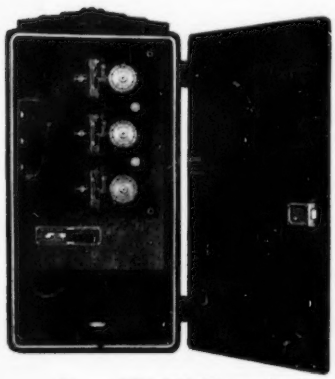


Type GF-5 Single Dial
Super-Trafflex Secondary



Type GF5-DD Two Dial
Super-Trafflex Secondary



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5. Secondaries remain in step during time cycle change.
6. Dial selection may be programmed from the master.
7. Secondaries remain in step during dial change.
8. Standard secondaries provide 15 separate and independent color circuits and 16 intervals. A change in color sequence is made by resetting permanent steel lobes in bakelite cams, which are color-coded for easy identification. Cam units for 21 and 27 color circuits are available.
9. The basic, underlying principle of the *Trafflex* control system has been proven by 25 years of successful operation throughout the world. Any *Trafflex* secondary ever built will operate from a modern *Super-Trafflex* master.

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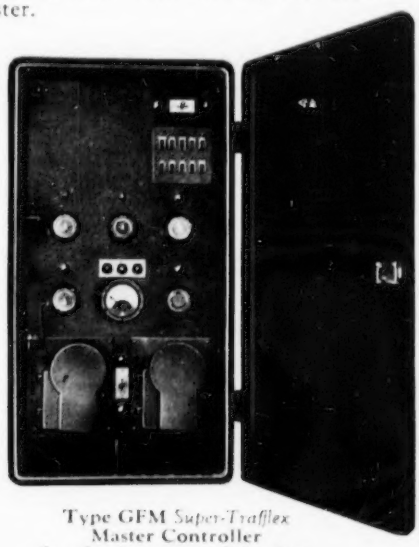

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The Missouri State Highway Expressway Program

By Rex M. Whitton

Chief Engineer, Missouri State Highway Department, Jefferson City, Mo.

THE MISSOURI EXPRESSWAY PROGRAM to date has been confined to the state's two large metropolitan areas—Kansas City and St. Louis. Traffic outstate has not yet increased to such proportions that the need for expressways there is foreseeable in the immediate future.

Instead, to meet outstate needs, divided pavements are being constructed, or planned, on the interstate and other most heavily traveled routes. Right of ways for them are being acquired on a limited, or controlled access basis. Such divided facilities are being designed and built so that, as the need arises, they can be expanded to modified expressway standards by adding outer, or service roadways and by installing separations at intersections with other state highways. Although it will be some time in the future before they will be necessary, sufficient right of ways for those separations are being taken as initial improvements are made.

Detailed preliminary studies already have been carried out to determine traffic demands, and what steps are necessary to meet traffic problems in both metropolitan areas. Some of these studies—Origin and Destination surveys—date back as far as 1944 and 1946. They were begun then when the State Highway Commission and its engineers recognized the urgent need that was developing and began planning to meet it, although they were well aware the job could not be handled with finances then available.

The Missouri Highway Department now is operating under a 10-year highway modernization and expansion program, during which it is estimated 557½ million dollars will be spent toward meeting minimum highway needs in the state. Under that program, $142,000,000 is allocated for use on urban projects. That amount is expected to be apportioned with $79,000,000 for use in St. Louis and St. Louis County, $34,000,000 for use in Kansas City, and $29,000,000 for use in the other 38 cities in the state having more than 5,000 population each.

The City Plan Commission of Kansas City, Missouri, in March, 1951, published a comprehensive engineering report on expressway needs in the Kansas City metropolitan area. This report embraced the combined thinking and the cooperative work of all city, state and federal highway planning agencies in the area. It now is being used as a guide as programming and construction moves forward on the much-needed expressway system to serve the Kansas City area.

This proposed expressway system is based on broad planning studies which have been conducted over a period of the last ten years. A detailed analysis was made of the data collected in the Origin and Destination surveys of 1944 and 1946. Some of the data collected then was factored to fit present day traffic conditions, then was projected into the future to show probable demands as late as 1970.

These studies indicate that only 10 to 15 per cent of the traffic on interstate routes at the perimeter of the metropolitan area wish to by-pass the central business district. For that reason all interstate routes are carried to and skirt the downtown districts of both Kansas City, Missouri, and Kansas City, Kansas.

The freeway loop surrounding the central business district of Kansas City, Missouri, will serve as the distributor and connector on which the five interstate routes and other expressways within the metropolitan area converge. The loop also will serve as a by-pass for about 40 per cent of the traffic now using the downtown streets, and which has neither origin nor destination in this intensively developed area, thus relieving other downtown streets from by-pass traffic. It will serve as a distributor traffic artery, furnishing access to the four sides of the central business district and to the adjoining business and industrial areas.

This loop around the central business district is formed by four freeway sections:

(1) The Intercity Freeway, or north leg, extends from the Intercity Viaduct on the west to an interchange with the Midtown Freeway on the east. It provides direct connections to an improved approach to the A-S-B Bridge, and to the new Paseo Bridge across the Missouri River, which will carry Interstate U. S. Routes 69 and 71 along the North Midtown Freeway;

(2) The downtown section of the South Midtown Freeway, from 6th Street south to Truman Road, furnishes the east leg of the loop and lies along Campbell Street;

(3) The south leg, or Crosstown Freeway, extends eastward from the vicinity of 15th Street and Pennsylvania Avenue to connect with the east leg at Charlotte Street, immediately south of 14th Street;

(4) Two alternates are being considered for the west leg, or West Freeway. One would carry the Freeway around the bluff in North Terrace Park to a connection with the Intercity Freeway. The other provides for a tunnel connection from 15th Street and Pennsylvania Avenue to the Intercity Freeway at 6th Street.

Interstate U. S. Route 40 is connected to the central business district loop by the extension of the Crosstown Freeway west to Truman Road and Indiana, thence southeast over the Southeast Freeway to the vicinity of 27th Street and Norton, where it intersects the Missouri Freeway, which extends from this point eastwardly, connecting with U. S. Route 40 in the vicinity of the present crossing of the Blue River.

A connection is provided from the interchange in the vicinity of Truman Road and Benton Boulevard, on the Crosstown Freeway, to 9th Street and Van Brunt Boulevard to serve U. S. Route 24 traffic.

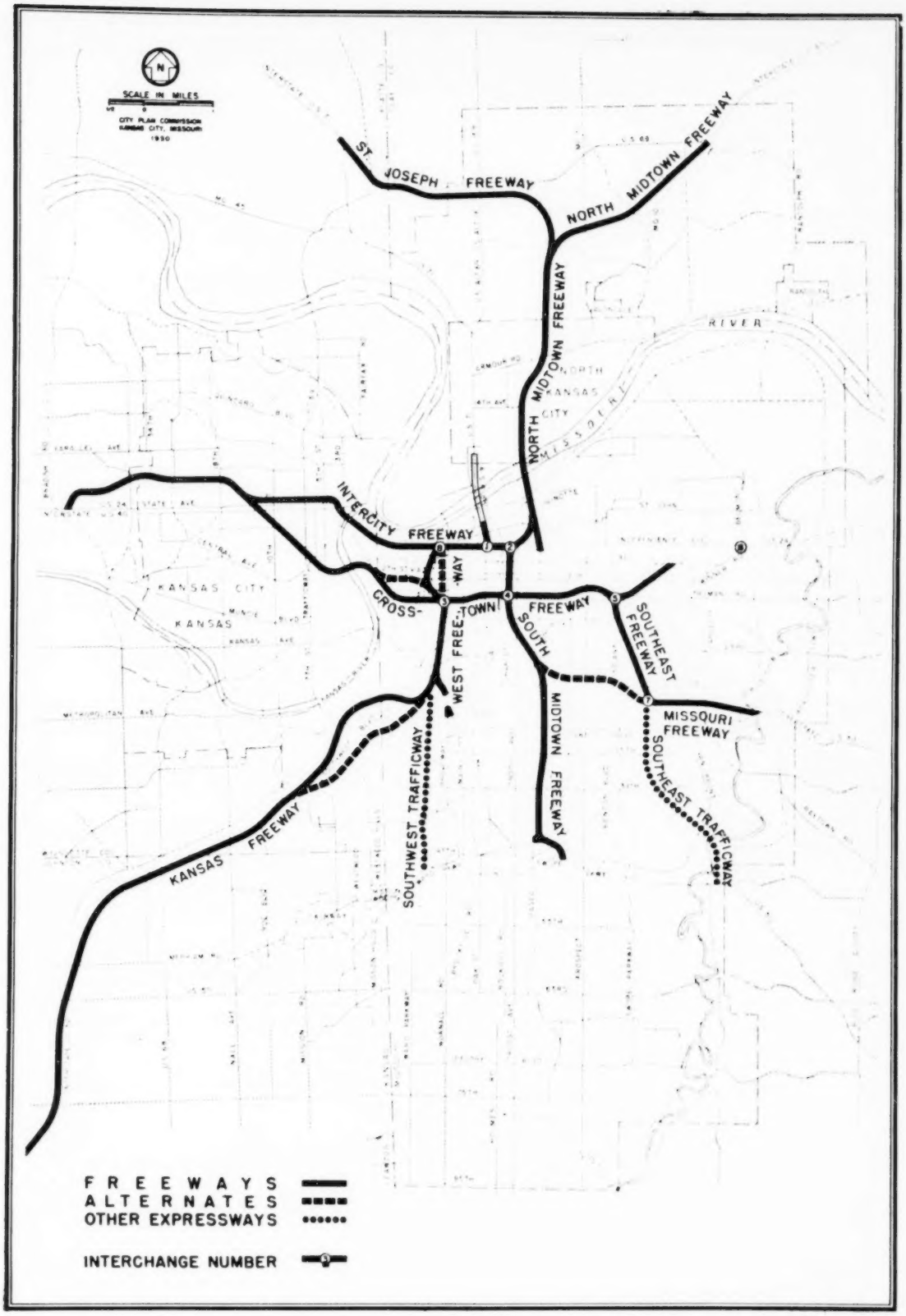

Fig. 1
Recommended expressways, Kansas City, Mo.

A connection is provided to U. S. Route 50 by the Southeast Trafficway, an expressway with partially controlled access, which begins at the interchange with the Southeast and Missouri freeways, and extends southeasterly to connect with U. S. Route 50 near the east city limits, between Topping Avenue and Oakley.

The North Midtown Freeway provides access to the central business district for Interstate U. S. Routes 69 and 71 from the north. This Freeway leaves the northeast corner of the central business district loop, crosses the Missouri River over the new Paseo bridge, passes through North Kansas City, and that portion of Kansas City, Missouri, north of the river. At the junction of the St. Joseph Freeway and the North Midtown Freeway, in the vicinity of Russell Road, the North Midtown Freeway turns right, connecting with the present dual lanes through Claycomo near the northeast city limits of Kansas City.

The St. Joseph Freeway turns left just north of Russell Road, crossing Oak Street just south of the present intersection of U. S. Routes 169 and 69, and connects with U. S. Route 71 in Platte County.

Traffic destined for the southwest, from the central business district, will use the completed West Freeway from the southwest corner of the business loop to the interchange at 27th and Summit, in Penn Valley Park. It then will continue southwestwardly, over a new right of way with fully controlled access, following U. S Route 69 to a connection with U. S. Route 50.

Two locations are being considered for this portion of the Kansas Freeway, from 27th and Summit at the Penn Valley interchange, west to approximately two miles beyond the state line.

The Crosstown Freeway, in addition to the two sections previously mentioned, consists of a third section. Beginning at 15th Street and Pennsylvania Avenue it extends northwestwardly from the southwest corner of the business loop across a multitude of railroad tracks and the Kaw River, connecting to the east end of the Central Avenue Viaduct in Kansas City, Kansas. This section of the Crosstown Freeway provides a second intercity connection meeting full freeway standards.

In addition to the connections to the interstate and highway routes described above, additional freeways were deemed necessary to alleviate Kansas City's traffic congestion and provide access to the business district.

The South Midtown Freeway would extend southeast and south from the southeast corner of the central business loop to the Brush Creek valley. Freeway construction would terminate at 45th and Paseo, with a second connection to the Brush Creek Parkway and the Swope Parkway at Brooklyn. This would serve as another connection to U. S. Route 50.

The Southwest Trafficway has been completed from 27th and Summit to 43rd Street and Belleview. It will be extended eventually to Ward Parkway, thus giving another connection to U. S. Route 50 and the Brush Creek Valley.

It is also proposed to connect the Southeast Trafficway to U. S. Route 71 south, with a water level route following south along the Blue River Valley.

The eight freeways and the two expressways have been located and designed to serve efficiently the intra-urban and interurban traffic flow and to fit into a logical, unified rela-

(Continued on page 492)

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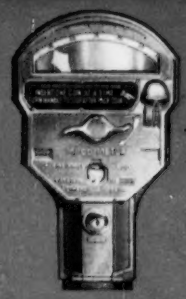
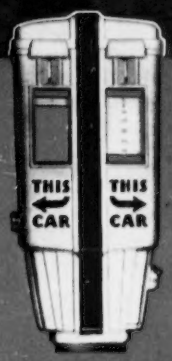


MI-CO MANUAL



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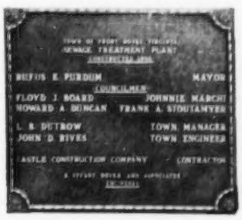

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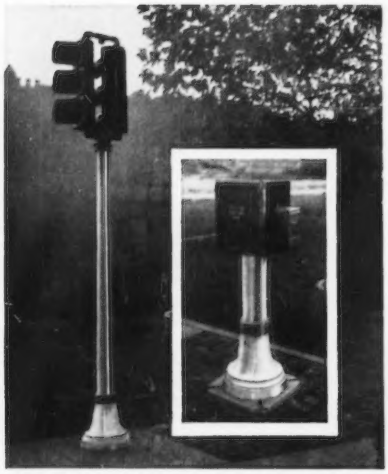

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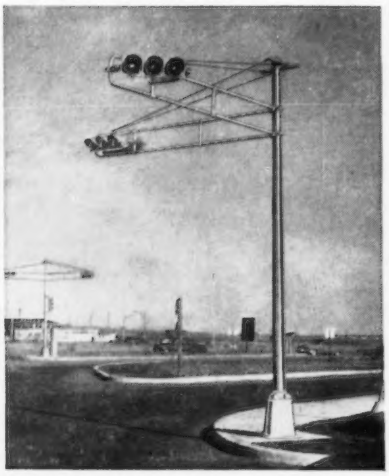

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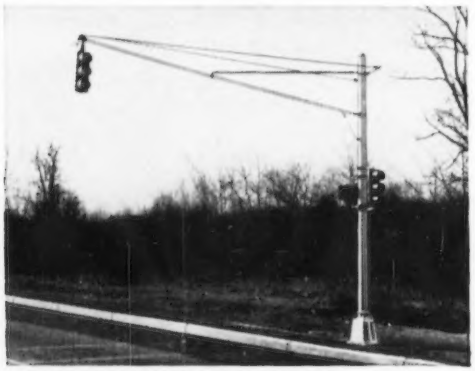

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Toll Bridges in the Kansas City Area

By R. N. Bergendoff

Howard, Needles, Tammen, & Bergendoff, Kansas City, Missouri

MANY CITIES in the United States trace their origin to settlements along the coast, on the shores of inland lakes or on the banks of a navigable inland stream. Founded on the banks of the Missouri River, Kansas City's early commerce relied upon river navigation as a major factor in its early transportation facilities.

With the development of the railroad and its extension westward, the early history of Kansas City reveals the importance of the Hannibal Bridge, built in 1869 as the first bridge across the Missouri River to carry the railroad into the southwest.

At the turn of the century, the development of the internal combustion engine started the great surge of highway motor vehicle traffic. With the ever increasing importance of this mode of travel the Missouri River, a distinct asset in the early development of Kansas City, then became a physical barrier in the layout and extension of arteries of travel for the motor vehicle. The era of road building of the 1920-1930 period centered around the slogan "Get us out of the mud" with emphasis on maximum mileage of highway at minimum cost per mile. Large, expensive bridge construction across major streams did not fit into such a program, with the result that physical barriers such as the Missouri River greatly retarded road building in spanning major streams and also had a decided influence in shaping the direction and the extent of growth of a city.

As a result, Kansas City, Missouri, expanded to the south and east, where arteries in the way of streets and boulevards could be built with the greatest economy leaving the Central Business District central in name only.

Faced with the realization that the restriction of the Missouri River on the north, the incorporated limits of Independence on the east and the Kansas state line on the west, decidedly limited the growth of Kansas City, Missouri, the leaders of the city recognized that future growth of the city lay in an area north of the river. With annexation of a large tract of land to the north of the river in 1950 and rapid increase of cross-river traffic the importance of improved highway facilities for inter-communication became more apparent.

The importance of the area north of the river is indicated by the growing volume of cross-river traffic. The number of vehicles per year is shown in the following table:

Year	*A.S.B.*	*Hannibal*	*Fairfax*	*Chouteau*	*Total*
1946	8,087,305	2,582,720	548,960		11,218,985
1947	9,392,545	2,692,970	658,095		12,738,610
1948	10,278,035	3,350,700	785,115		14,413,850
1950	11,987,695	3,885,425	2,721,805		18,594,925
1951	12,923,555	3,745,265	3,396,690		20,065,510
1952	14,782,500	4,562,500	4,070,000		23,415,000
1953**	15,100,000	4,600,000	4,500,000	525,000***	24,725,000

**Estimated. Based on available records to date.
***Opened September 17, 1953. Estimated for September 17 through December 31.

Fig. 1
View of the Paseo Bridge at Kansas City showing it ready for the concrete floor on June 14, 1954.

The barrier formed by the Missouri River in the Greater Kansas City area is shown on Figure No. 1. After August 13, 1954, five structures will serve cross-river vehicular traffic, namely, the Fairfax, Hannibal, Armour-Swift-Burlington,

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Paseo and Chouteau Bridges. It is of particular interest that prior to 1936 only two of the bridges existed as highway crossings, the Hannibal and the Armour-Swift-Burlington structures.

The Hannibal Bridge is a combination railway-highway structure built and owned by the Chicago, Burlington & Quincy Railroad Company. It provides a double track railway on a lower deck and for highway traffic on a 20-ft. wide roadway on the upper deck. The provision for highway traffic on the bridge is, and has been, a minor and secondary consideration. The present Hannibal Bridge replaced an earlier single track bridge on approximately the same alignment on which highway traffic was accommodated by a wood floor at track level. From July 3, 1869, when the first bridge was opened to traffic, until 1928 the railroad company charged tolls for highway traffic. In 1928, Kansas City, Missouri, leased the highway deck from the railroad company for a nominal rent and the obligation to maintain it and then made the highway free for traffic.

The Armour-Swift-Burlington Bridge, generally referred to as the A.S.B. Bridge, also is a combination railway-highway bridge with a railway track on the lower deck and highway traffic on the upper deck. As originally built, the upper deck accommodated interurban cars as well as highway traffic. Built at a cost of $2,400,000, the bridge was opened to traffic in 1912. Tolls were charged for highway traffic until 1927 when Kansas City and Clay County jointly acquired a perpetual easement and made the highway deck a free facility. Until the completion of the Paseo Bridge, the A.S.B. Bridge has been the principal crossing for highway traffic at Kansas City.

In 1936 the Fairfax Bridge, a highway structure with a 22-ft. roadway jointly owned by the states of Missouri and Kansas was opened to traffic. It was financed through the sale of revenue bonds and operated as a toll bridge until 1950.

The old Milwaukee Bridge at Randolph Point was abandoned for railroad purposes in 1945. Acquired by the city through the sale of general obligation bonds, a highway deck and suitable approaches have been built so as to provide a two-lane highway roadway 20-ft. wide. The structure is operated free of toll. Renamed for an early pioneer, the structure is known as the Chouteau Bridge.

A great deal of study has been given, over a period of years, to the construction of a bridge across the river in line with the Paseo. In every instance, prior to 1952, the actual construction of a bridge was never realized, primarily because of lack of public funds for the project. There was little likelihood of general obligation bonds being voted at the local level. Use of state or federal funds for a project of this magnitude and limited length would deprive Kansas City of many badly needed expressways programmed to be built with state and federal financing. In September 1951, the County Courts of Jackson County and Clay County, representative of the area to be served and at the request of the Citizens Regional Planning Council, undertook to sponsor a toll bridge at the Paseo location. The engineering firm of Howard, Needles, Tammen & Bergendoff, retained as engineers on the project, made studies of traffic financing feasibility and later designed and supervised construction of the project. Revenue bonds were sold in August 1952 and the four-lane project was opened to traffic in August 1954.

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Revenue bonds in the amount of $17,750,000 have been sold for obtaining funds for construction of this project.

The City of Kansas City, Missouri, with its investment in the Municipal Airport and recognizing the inadequacy and obsolescence of the highway facilities available on the upper deck of the Hannibal Bridge, is selling $13,000,000 in revenue bonds for the construction of a new four-lane bridge to be built directly upstream from the Hannibal Bridge, to be named the Broadway Bridge. The project will include a highway approach extension north of the Municipal Airport to connect with Highway U. S. 71. On completion of the Broadway Bridge, the upper deck of the Hannibal Bridge will be closed to vehicular traffic.

Of the six bridges serving the cross-river traffic of Kansas City now in operation or under construction, five have been made possible by financing through the collection of tolls. Kansas City is not unique in this respect, as many of the major highway bridges in the country have only been made possible by the sale of revenue bonds amortized through revenue received from the collection of tolls.

Within the fifty years in which we have had the motor vehicle, there have been radical changes in public opinion as regards the toll bridge method of financing. In the twenties, Highway Departments, with limited funds, were seeking to extend the all-weather roads and in their programs avoided expensive stream crossings. In that period congressional franchises for construction of toll bridges across interstate waterways were readily granted private corporations or private individuals. Financed through the sale of stock and in some instances with no recapture clauses in their franchises, these private corporations constructed bridge facilities located in strategic points of our rapidly growing highway system. Public money in turn was used for developing and improving the approach highways to these river crossings. In many instances, the structures became profitable ventures for their owners. Gradually the public began to resent this situation and many states undertook a program of buying toll bridges and freeing them to traffic. The trend in this period became away from toll bridge construction and operation. Public opinion in Kansas City passed through this same cycle as exemplified in freeing of the Hannibal and A.S.B. Bridges in 1928.

With the ever increasing traffic on the highway, the problem of financing more and larger structures continued to confront public officials. In the early thirties, after Congress discontinued the practice of granting franchises to private corporations and individuals the revenue bond method of financing became very popular.

Under this program bonds sold were limited to an amount necessary to pay for construction and incidental costs. The bonds were issued by public agencies authorized by state enabling legislation and as such, interest on the bonds was tax exempt. As a result this type of security has become much in demand by investors seeking tax exempt income. Administered by public agencies, all revenue collected has been carefully accounted for and used exclusively for bond servicing, operation and maintenance costs. With few exceptions these bond issues are being amortized at a more rapid rate than set up in feasibility studies made prior to financing. The success of this venture is largely due to the careful scrutiny and study given to the project in determining the feasibility prior to financing. The bridge facilities become free for traffic on amortization of the bond issue.

Faced with the demand and necessity of more bridges across the Missouri River and ready to overcome all hurdles in its progress forward, the people of the Kansas City area realize the "power of the dime" in financing new structures. For ten cents per passenger car, traffic will soon flow on the new Paseo Bridge and in another two years on the Broadway Bridge. In the case of the Paseo structure, traffic will be able to avoid the congested conditions on the A.S.B. Bridge and will be able to drive a distance of over three miles on the limited-access, dual lane expressway leading directly into the heart of the city from the north. For those who are daily confronted with the congestion on existing structures, it will be a bargain to drive on this facility which costs $6,000,000 a mile.

The Broadway Bridge will not only open up a modern, four-lane structure across the Missouri River giving direct access to the Municipal Airport from the south, but will provide a new direct connection from the north. Entering the north approach at its intersection with U. S. 71, traffic will avoid the congestion on Burlington Avenue and a number of railroad grade crossings through the Harlem area.

The old saying, "You can't have your cake and eat it too" may not be true when applied in principle to the Paseo and Broadway Bridges. Although Kansas City foresees great development in its annexed area north of the river the feasibility reports for financing of the Paseo and Broadway Bridge projects were necessarily based on cold facts and statistics dealing with traffic to date. In the study of amortization of revenue bond issues for the projects, it was found necessary to obtain certain underwriting to show proper coverage in revenue and income. For bond sale purposes anticipated income in revenue should generally be 50 per cent in excess

Fig. 2
Bridges at Kansas City

of that required to meet operation, maintenance and bond servicing costs in the maturity period of the bonds. Under agreements reached between the State Highway Commission, Kansas City, Missouri (and Jackson and Clay Counties in the case of the Paseo Bridge Project), the city agreed to earmark certain funds allocated by the State Highway Commission and normally spent within the city on highway improvements. Such funds were to be used only if needed for servicing the revenue bonds issued against the respective projects. By such assignments the earmarked funds contributed to the coverage needed for the bond sale purpose. For the Paseo Bridge Project $800,000 a year for ten years is earmarked and for the Broadway Bridge $200,000 a year is earmarked for a six-year period.

It is anticipated that a very limited amount of these underwriting funds will be needed in amortization of the bond issue, in which case, the earmarked funds may then be released to be used on other projects to be built by the Highway Department in the Kansas City urban area.

The Intercity Viaduct, connecting Kansas City, Missouri, and Kansas City, Kansas, carries today some 47,600 vehicles per day. Prior to its construction in 1905, the only route between the cities was down the hill along Bluff Street to the west bottoms. Traffic had then to cross all railroad tracks and ascend the hills on the west. It is of interest that the Intercity Viaduct constructed following the 1903 flood was built as a toll project. Constructed, however, before the rise in motor traffic, it was a financial failure for its promotors and it was not until some years later that the motor car justified its construction.

The history of Kansas City has definitely shown the place of toll projects in the development of the community. As the Intercity Viaduct, the A.S.B. and Hannibal Bridges built as toll projects to meet the needs of the day have provided the main arteries of communication between the areas served, so it may be expected that the new structures, the Paseo and Broadway Bridges designed as modern highway expressways will influence the growth and development of the areas to the north.

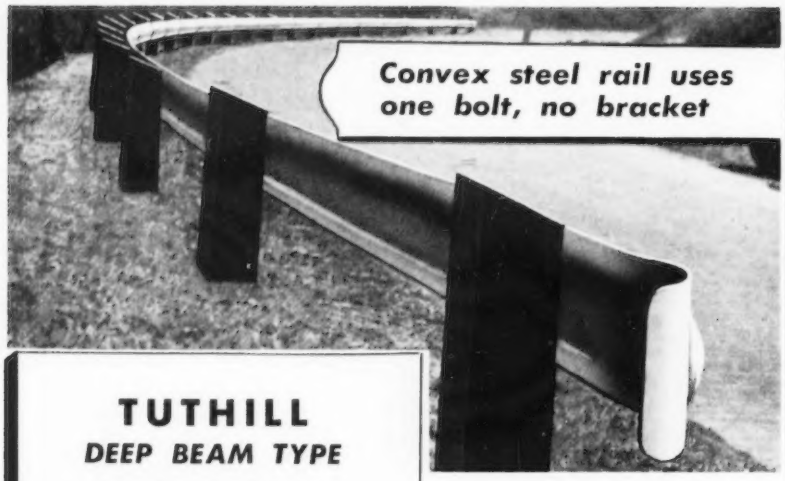
The experience in the development of toll roads and toll bridges has demonstrated the willingness of the traveling public to pay a nominal charge for the privilege of driving over modern high-speed facilities. This willingness to pay is clearly evident when traffic is diverted to the toll facilities even though parallel free facilities of inferior standards are available for use. The Paseo and Broadway Bridges in Kansas City, operating as toll projects, will compete with the Fairfax, A.S.B. and Chouteau Bridges which are free of toll. The traveling public will have choice of either type of crossing. The willingness to pay toll for the use of a superior facility lies entirely within the individual's choice. Without the toll facilities, Kansas City would otherwise wait many years before comparable improvements could be built as free crossings.

TRAFFIC CONTROL IN A CITY MANAGER CITY

(Continued from page 446)

ment are not all of the activities in which it is engaged. It also partakes in educational and inspection work.

The Director of Traffic Department makes periodic inspections of school buses and equipment, and has the authority to make reasonable regulations concerning the operation of the equipment and handling of children in transit. The Director of Traffic also conducts examinations for applicants



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for school bus chauffeur's license to determine whether or not they are qualified to operate school buses. These licenses are issued only upon approval and certification of the Director of Traffic.

In the field of education the Traffic Department also engages in public safety educational work in which the city cooperates, with the Safety Council, press and radio and other agencies attempting to inform the public and to disseminate information. This includes working with the Mayor's Traffic Safety Committee, which is composed of leading citizens to aid in promoting traffic safety measures.

Summary

The philosophy of a traffic program should always be positive and dynamic. The successful traffc program must be a means of developing a safer city capable of accommodating, in an expeditious manner, its traffic volume. Neither may the welfare of the pedestrian be left to chance. The organization for this program should be centralized, but the activities of a Traffic Department must be closely coordinated with the activities of departments carrying out related functions. The Traffic Department should also be so organized as to be responsive to the needs of the citizens.

A dual approach to traffic engineering-planning and building for the future with long-range projects, and applying immediate remedies to improve existing facilities—will enable municipalities to wage a successful battle against the blight and personal hardship brought on by unchecked traffic congestion. In Kansas City a combination of vision and reality has been utilized to carry out a traffic engineering program that will provide relief and benefits to its citizens of today while building a framework for a better city tomorrow.

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KANSAS CITY, MISSOURI STREET LIGHTING MODERNIZATION PROGRAM

(Continued from page 478)

the ratio of night-to-day accidents should be the most stable analysis. The following table compares these ratios:

Type of Accident	*Before*	*After*
Property Damage	.55 to 1	.52 to 1
Injury	1.07 to 1	.65 to 1
Fatality	9.0 to 1	1.33 to 1

One might conclude from these figures a sizable reduction in the number of the more severe accidents. It will also be observed that the property damage ratio is approaching the 0.5 to 1 ratio of night-to-day traffic volumes.

Unfortunately, we have as yet not compiled sufficient data to properly evaluate the effect of lighting modernization in improving the night crime picture.

Public Reaction

As a whole, the lighting program has been received by our citizens as a great improvement. Practically no objections have been registered to the arterial phase. So far as lighting residential streets, considerable reaction has appeared, the bulk of it in favor. Some complaints have appeared where we have removed an old light from position approximately midway between new lamp locations. Despite the obvious improvement in average block intensity, the vastly decreased illumination back at the house front gives rise to apprehensions. A rather severe limitation on the manpower available to us for tree trimming often results in lack of full utilization of the new equipment. At some locations, the density and type of foliage is such that only tree removal would adequately serve the lighting system. Consequently, certain complaints are justified.

On the other side, new light objectors are offended by the pole, wires (at overhead installations) house front illumination, or combinations of all three. The startling change brought into a formerly dark block by street lighting often produces rather ludicrous expressions. We once received two petitions from a certain block, one signed by the housewives in favor of the new light, and the other signed by their husbands objecting to it.

We have cancelled orders for several midblock lamps because of majority petitions opposing the lights. Investigation has shown that in some cases, one or two individuals have impressed their will upon the majority by misrepresentation in order to obtain the petition.

We recognize that the standards adopted for our residential lighting are slightly below the I.E.S. recommendations. However, as indicated above, we have tried to strike a favorable balance among people who want a lot of light, people who want little or no light, and our financial capabilities. In this, I believe we have been fairly successful.

No discussion of Kansas City's lighting program would be complete without stressing the wonderful cooperation the Power & Light Company has given the city in making the improvement possible. In hundreds of cases, the Company has invested labor and materials above the basic contract requirements in order to improve general overall appearance, efficiency of light utilization, and public relations. We feel Kansas City is justly proud of both the new lighting system and the Company which expedited it.

On the city's side, T. J. Seburn, former Director of our Traffic Department, conceived the relighting program and personally nursed it through many critical steps. Results always tend to speak for themselves and the infant, now almost grown, lights the way of each and every Kansas Citian.

TRANSIT IS TIED UP IN TRAFFIC

(Continued from page 471)

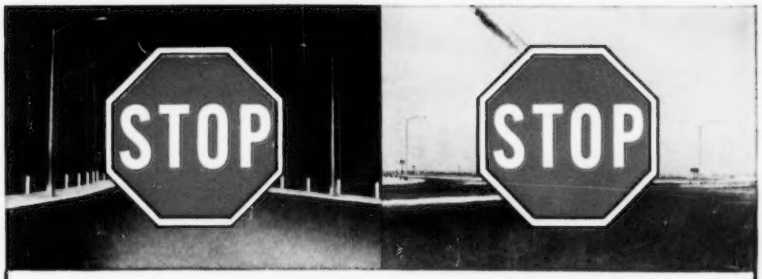
Henry A Barnes, Director of Traffic, Baltimore, Maryland:

> "• • • It seems a shame, and a terrible waste of public money, to have all this planning and construction done with no correlation between traffic and transit problems."

The time to coordinate the planning and take bold measures is now. It is later than you think. Traffic congestion is one of the most, if not *the* most, important problems facing the cities today. We must solve today's problem with today's thinking. Times have changed and transit must be brought more into the picture in planning future roadways or changing the present ones.

Many years ago we thought in terms of private water and sewage systems. Where would we be today if we continued to throttle the private water companies and encouraged everyone to arrange for their own private water supply.

And so today, most cities have found that private enterprise alone cannot solve their parking problems. And for all its outstanding accomplishments, private enterprise cannot build an expressway or rearrange street usage. Thought must therefore be given to the future relationship of government and transit. If it is determined that the interest of all concerned is best served by setting aside separate streets or separate lanes for transit, or to incorporate transit lanes in future expressways, or to establish fringe parking lots served by transit, or any other such measure, the government, whether it be local, state, or federal, should face the problem squarely and act accordingly.



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Good transportation has always been the backbone of a progressive city. The efficient use of public transit for moving people has been a most important part of the city development. The automobile now has its right also in the present and future development but we must maintain a good balance in making expenditures for street and roadway use.

Through improved streets and expressways, and through parking facilities, the subsidies the governments have given to the auto user have been tremendous. Yet recent surveys show that here in Kansas City 56 per cent of the shoppers and 75 per cent of the workers still use public transit to get to the central business area.

Many of them no doubt drive autos at some time and thereby also share in the benefits for the auto user, but they are also vitally interested in what is done for them as transit riders. They know that if measures are taken that will give their bus a clear path, their trip time will be materially shortened. They know that if that is done, more people will ride transit which will mean more buses on the line and a shorter wait at the stop. They know that when more people switch to transit, the streets will not be so choked with autos and those people having to drive through necessity will be able to move with greater flexibility. They also know that much less money will then have to be spent for street and trafficway improvements and thereby lessen their tax burden.

These things can be done if we are willing to take bold steps on the basis of sound planning. Real improvements have been made in the past through such action and must be done in this matter of traffic congestion if we are to move forward in the best interests of everyone. We must think always in terms of moving people and goods and not merely in terms of moving vehicles.

THE MISSOURI STATE HIGHWAY EXPRESSWAY PROGRAM

(Continued from page 482)

tionship with the other elements of the master plans of the three Kansas Cities. Convenient express service is provided, not only for the central business district but also for the industrial areas and principal residential areas. The system offers the same advantage to both trucking and public transit as it does to private vehicles. Locations of the freeways take advantage of vacant land wherever possible and give preference to the less developed areas in order to minimize the right of way costs and avoid displacement of families.

Traffic volumes on a metropolitan freeway system are influenced primarily by the location of the principal traffic generators within the metropolitan area. Special consideration was given to the central business district of Kansas City, Missouri, as the most significant traffic generator. A separate study of trips with an origin and destination in this area provided the basis for determining the relationship between traffic bound for this area and the total traffic volume on the freeways anticipated in 1970.

In making the traffic assignments it was necessary to assume all freeways and expressways in place. A method of considering vehicular travel time on expressways versus travel time on other thoroughfare routes was used in assigning traffic to the system. The percentage of expressway use was determined by this travel time comparison.

Maximum traffic volumes anticipated in 1970 should occur on the expressways as they approach or circle the central business district. The maximum volume is predicted on the West Freeway, south of 15th Street, and should amount to more than 72,000 vehicles daily, of which 10,000 will be commercial vehicles. The projected 1970 volume on the Midtown Freeway, south of the central business district, would be approximately 55,000 daily; on the Crosstown Freeway, east of Campbell Street, 62,000 movements daily. The central business district loop will carry 1970 daily volumes varying from 37,000 along the Intercity Freeway, 29,000 on the West Freeway, 57,000 along the loop section of the Midtown Freeway and 60,000 along the loop section of the Crosstown Freeway. The two expressway bridges over the Missouri River, A-S-B and the new Paseo bridges, are estimated to carry 20,000 vehicles daily in 1970.

The expressways are designed in accordance with the highway design standards developed by the National Interregional Highway Committee. The standards are based on a design speed of 50 miles per hour for expressways in generally rolling terrain. Access to the expressways is provided only at the most important streets and thoroughfares. Complete traffic interchanges are provided at intersections of all freeways and the A.S.B. Bridge approach.

The estimated cost of completing all of the Missouri portion of the proposed expressway system is $129,769,000, of

which $122,666,700 would be the cost of freeways and $7,102,300 the cost of other expressways. These figures include the constructed portion of the West Freeway from 14th Street to 27th Street and the constructed portion of the Southwest Trafficway from 27th Street in Penn Valley Park, where it connects with the existing West Freeway, to 43rd Street.

It is not anticipated that all of the system can be completed in the 10-year program period. In fact, estimated available funds will be sufficient for only a small part of the overall system. However, with state and federal funds available under the modernization and expansion program, plus the $17,000,000 revenue bond issue, provided by Jackson and Clay counties for construction of the North Midtown Freeway, it is believed the following portions of the freeway system can be undertaken:

(1) The Missouri portion of the Intercity Freeway.

(2) The A-S-B Bridge approach.

(3) The North Midtown Freeway.

(4) The St. Joseph Freeway.

(5) The South Midtown Freeway along the east side of the central business district loop.

(6) The Crosstown Freeway from the southeast corner of the business district loop eastwardly to Indiana Street.

(7) The southwest Freeway from Indiana and Truman Road to 29th and Norton streets.

It is estimated the above projects would entail the expenditure of about $37,000,000 state and federal funds and some $5,200,000 local funds. Right of way costs for the Intercity Freeway are not included in the above figures, as this expenditure was obligated before the 10-year program was set up.

State and federal funds already obligated or programmed for the Intercity Freeway, A-S-B Bridge approach, the North Midtown Freeway and the St. Joseph Freeway amount to approximately $9,794,009.63. Local funds obligated or programmed to these same projects amount to $3,035,000. In addition to these amounts is the $17,000,000 in revenue bonds issued by Jackson and Clay Counties for the construction of the North Midtown Freeway from the central business loop to Armour Road, which includes the Paseo Bridge over the Missouri River.

It was contemplated that the Missouri portion of the Intercity Freeway, A-S-B Bridge approach, North Midtown Freeway and the St. Joseph Freeway could be completed in the first three years of the 10-year program; however, due to the difficulties of obtaining the necessary right of way the program is lagging.

To date the completed portions of the system are: West Freeway, from 14th Street and Pennsylvania to 27th and Summit in Pen Valley Park, the Southwest Trafficway, from 27th and Summit to 43rd Street and Belleview. Under contract on the Intercity Freeway are the Bluff Street bridge, southwest ramp bridge off the Intercity Viaduct connecting to Bluff Street, Bluff Street and ramp, North Street service drive; Broadway, May and Wyandotte bridges and approaches. Under contract on the North Midtown Freeway, and nearing completion is the section from the northeast corner of the business loop to Armour Road. Another section from Armour Road north to Antioch Road only recently was put under contract.

When the program, or the major portion of the expressway program, is complete the Kansas City metropolitan area will have a highway transportation network sufficient for its needs. It will provide the traveling public with a safe and enjoyable trip to their destination, free from the physical discomforts now endured under adverse traffic conditions on the present city streets and thoroughfares.

In the St. Louis metropolitan area the recommended system is composed of three radial expressways—the Ozark, Daniel Boone, and the Mark Twain expressways—converging in downtown St. Louis. The Ozark and Mark Twain expressways (from the southwest and northwest respectively) would be linked in downtown St. Louis by the Third Street project near the river front, now being constructed under the joint auspices of the City of St. Louis, Missouri State Highway Department, and the U. S. Bureau of Public Roads. The Ozark Expressway, extending southwest, would connect in St. Louis County with U. S. Routes 66 and 61. It would be joined by a feeder, the Gravois Stub, to serve the area in the vicinity of the Gravois Avenue-Morganford Road intersection.

(Continued on page 496)

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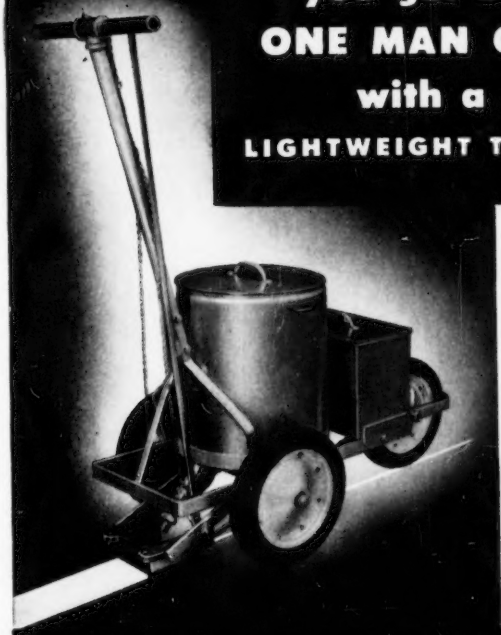

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Merchants Merry Go Round

By W. G. Austin

Manager, Merchants Association, Kansas City, Missouri

YESTERDAY the cry was for better transit and newspaper editorials were full of demands for more cars and the evils of having straphangers, a term that your child probably doesn't even understand. Today the demand is for more parking space and the debate is — should it be provided by private enterprise or is it a responsibility of the city government. Tomorrow we will need more expressways to handle the constantly increasing number of autos that are being produced. This is brand new up-to-the-minute thinking about current problems? Listen. Have you ever visited a market in Mexico, or a South American city? Every native who comes to market to sell his wares seeks the best location. He knows that the best location is where his wares can be seen by the customer and his inclination is to crowd in on an aisle. But he soon discovers that unless he leaves aisle room his prospective customer cannot reach him and he cannot sell his wares. Now if this aisle room, which he has so carefully provided, becomes clogged by people trying to travel through on a burro or other form of locomotion you can quickly see as he did, that the congestion of the customer could also stop his sales and market places prohibited the movement of customers except on foot. One of Buenos Aires main retail streets bars all traffic except pedestrian for certain hours of the day.

Our forefathers in retailing discovered that any method of moving people rapidly and cheaper than horse and buggy resulted in larger business centers and more business for them. Thus was born the horse cars followed by the electric trolley. The merchants' transportation problem was solved. But the solving of today's problem seemingly is but the reason and cause of one tomorrow. Then our merchant found, like the one in the market place, that he had insufficient aisle-space and his sales were being hampered. He had to enlarge. But he soon found that others on the Main aisle or Main street, did not want to give up their advantage either. So he went up in the air. The multi-floored store was born. The problem of space was solved and like its predecessors gave birth to a new one. People would not walk upstairs in sufficient numbers to make second floor selling efficient. What was the answer — mass transportation vertically — the elevator. Time passed and in some localities elevator capacities were exceeded and they had to go back to stairways — which moved.

The analogy of movement on our streets follows a similar pattern to that related on location. First came the path that was trod by human foot. It needed no additional width to carry a man on camel, burro or horse. But man likes to make it easy for his lady fair so he created a buggy. Then came the problem of a wider path. The need for space to pass buggies resulted in streets and roadways and of course with them came the street car and eventually the auto. These arteries have a way of being outgrown just as were the stairways and the elevator.

What is our next problem? You will recall that in the bazaar and market place the customer was prohibited from riding while shopping. What became of his conveyance? Well, what do you know — it had to be parked. That conveyance did not require 200 square feet to be bedded down, either. Why does man's progress keep piling problem upon solution and the solution create a new problem?

Who does the parking problem belong to? Some think that streets are useful as garages while others believe that streets are only a means to an end and when that end is reached you should be off the street. Rember the merchant in the market. Where there is ample width for street traffic as well as parking then parking can be permitted. But some system is necessary to eliminate those who would park in retail areas and prevent the efficient use of such space for prospective customers. Even the most ardent street parking advocate will not agree to all-day parking in front of his store — except for himself.

This problem gave birth to the Parking Meter, an automatic way of checking up on the salesman, collector, ad man or other that hates to walk from store to store, or office to office. These were the only type of people who complained when we installed them in Kansas City way back in 1936.

This subject of parking is most interesting and greatly misunderstood. There are many types of parking needs. Customer, which may be for a matter of a few hours to a few minutes. Executive, which can be for a few minutes to some hours. Worker, which usually is the length of the work day. The costs of these types of parking and the locations are often in proportion to their distance from the business center. However their usefulness is not on the same ratio. Usually a garage or lot situated close to the business center will have a higher rate for service than those located some distance from town. This higher rate is justified because of the rent the proprietor has to pay for the preferred location. His rate for an all-day customer is so high that he eliminates the worker and this is as it should be as it leaves the space for the store customer who is willing to pay a fair fee for short time service and the turnover of numerous customers daily nets the operator the revenue needed to make a profit.

This garage also attracts another customer, the executive. He can afford to pay the rate to park all day but he does not stop to realize that he cannot afford to occupy a space that 912 customers would use in one year in a garage or lot with 2½ times daily turnover.

Naturally, the favorite parking space is right at the front door. That is the same as the 50-yard line seat at the football game, and the man who finds a way to park 500 cars right at the retailer's front door, is in the money, despite income tax.

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Los Angeles, California

The garage located some distance from town will serve the worker who finds it necessary to drive to work. Its lower all-day rate will attract this type of trade. However most experts agree that such space is not attractive to shoppers and they also maintain that 1000 feet is the absolute limit that they will travel from a garage to the retail store of their choice.

Whose responsibility is this provision for parking? Some business men think it is the city's. Others have the opinion it is their own. Most cities have a downtown district that pays a high portion of city taxes, amounting in some cases to as much as 40 per cent. If the city is persuaded to believe that it is public responsibility to provide off-street parking for business districts the downtown districts will find themselves in the unique position of paying for a large portion of off-street parking in suburban shopping centers. You can be sure that such areas will demand parking facilities from the city if they are furnished to the downtown area.

Kansas City merchants have helped finance parking by buying garage debentures to build garages in locations that are attractive to customers. They have thus assured parking availability to their customers without going into the garage business themselves.

Tomorrow, we will need more and wider trafficways to help bring in and take out this flood of autos that converges on the business center each day. East new one as it is built promises to one and all that it will relieve the press of traffic congestion and as it relieves other streets of their congestion the city problem will be eased. What happens? Hardly a month after such an artery is opened we find that it is taxed to capacity and the streets that were supposedly to be relieved are just as crowded if not worse.

Needless to say the cost of such arteries has grown by leaps and bounds as our property values have increased and our economy has been inflated. States have found it wise to revert to the old-time system of toll roads to obtain the highways they desire. I wonder how soon we will find a tollway through the heart of one of our large cities?

Well, there is your Merry-Go-Round. From footpath to expressway to moving footpath. From stairway to elevator to moving stairway. From pasture to compound to parking lot. We graduate from individual locomotion to mass transportation and back to individual automotion.

Certain it is that it would be impossible to bring into any major city all of the people that congregate in their business section by autos alone. To illustrate: Kansas City has 60,000 people in its downtown district daily. If all these folks came by auto it would require garage space equal to 35 square blocks, an area larger than the central business district.

The solution: Gee! that's easy. We should all have wings then transit, trafficway and tenure would not be needed. You say this is the wrong place for wings. Guess the Merry-Go-Round made me dizzy.

THE MISSOURI STATE HIGHWAY EXPRESSWAY PROGRAM

(Continued from page 493)

The Mark Twain Expressway, extending northwest, would connect, a short distance south of St. Charles, Missouri, with a new alternate route of U. S. Route 40 which will cross the Missouri River at that point. The Daniel Boone Expressway, beginning with branches on each side of the downtown business district and uniting at Grand Boulevard, would approximately bisect the fan shaped area formed by the Mark Twain and Ozark expressways, connecting at its western end with the existing divided pavement of U. S. Route 40 near Brentwood Boulevard.

In addition to the three expressways described above, the Red Feather Highway-Market Street connection will be improved by construction of a cutoff of expressway type. Market Street will be further improved by construction of a grade separation at the intersection with Grand Boulevard.

The total estimated cost of the 53-mile expressway system in St. Louis and St. Louis County is $160,000,000. As of July 1, 1954, about $13,150,000 of state, federal and local funds had been spent or were under contract for construction and right of way on the Third Street project. An additional $6,900,000 had been programmed. This includes the Market Street-Red Feather connection and the Market Street-Grand Boulevard separation, expected to cost about $3,250,000, with the remainder being mostly for right of way.

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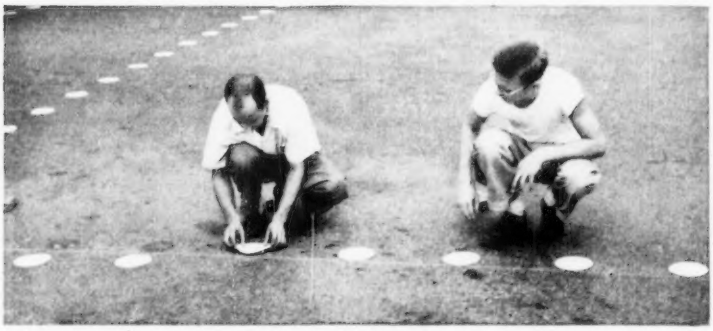

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